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MONITORING WATER QUALITY IN THE FLATHEAD BASIN:1986

An Interagency Report of Data Collected Under the Auspices of the Flathead Basin Commission's **Master Plan for Monitoring Water Quality in the Flathead Basin.**

Prepared by:

Flathead Lake Biological Station
Flathead National Forest
Montana Department of Fish, Wildlife and Parks
Montana Department of State Lands

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INTRODUCTION

The **Master Plan for Monitoring Water Quality in the Flathead Basin** (Flathead Basin Commission 1986: Biennial Report Published by the Office of the Governor, Helena, MT) was implemented in 1986 to insure that a systematic and long term data base was gathered and the data made available to agencies involved with management of water resources. This was done to provide a data baseline which could be used to document the changing status of water quality in the Flathead Basin and justify management options. The rationale for the program is that environmental quality of the Flathead Basin is largely reflected in the relative cleanliness of water, as expressed in measures of chemical and biotic (including fish) importance.

The **Master Plan** rather broadly defines water quality to include major dissolved and particulate chemical constituents, measures of limnological importance, including plankton (algae and fish forage organisms) counts in Flathead Lake, and enumerations of sport fish populations and related variables. The various agencies responsible for water resources management or research within the Flathead Basin monitor water quality variables at specific locations (Table 1).

This report is a presentation of all recent data gathered per the **Master Plan**. No really concerted effort is made herein to provide detailed interpretations of these data because each agency is required to publish reports which include detailed data analyses, interpretations and recommendations. A bibliography of these reports is included within each agency section. Most of these reports are maintained in the library of the Flathead Lake Biological Station or may be obtained from the various agencies. The main purpose of this report is to provide water quality data collected to date as agreed upon in the **Master Plan** and as funding has permitted.

The data are reported in 3 sections by the agencies charged in the **Master Plan** with monitoring tasks. Agencies included in the **Master Plan** but not reporting data herein either did not have funding needed to do any of the work or were unable to cooperate in preparation of this report. Hydrologic data (e.g. discharge) and limited water quality data collected by the U.S. Geological Survey was intentionally not included because USGS data are readily available in computer files (WATSTORE) and in annual reports. All of the analytical data included herein will eventually be posted to the computer file (STORET) maintained by the U.S. Environmental Protection Agency.

Table 1. Flathead Basin Commission site numbers and locations.

PREFIX	NUMBER	LOCATION
ALL	01000	N. Fk. Flathead River Drainage
ALL	02000	S. Fk. Flathead River Drainage
ALL	03000	M. Fk. Flathaed River Drainage
ALL	04000	Stillwater/Whitefish River Drainage
ALL	05000	Mainstem including Lake
ALL	06000	Swan River Drainage
ALL	07000	Flathead River Below Kerr Dam
ALL	08000	Crow Crk. Drainage
ALL	09000	Post Crk./Mission Crk. Drainage
ALL	11000	Jocko River Drainage
ALL	12000	Little Bitterroot Drainage
ALL	13000	East Of Divide
FBC	01001	N. Fk. Flathead River @ International Border
FBC	01002	Sage Crk.
FBC	01003	Spruce Crk.
FBC	01004	Kishenehn Crk.
FBC	01005	Starvation Crk.
FBC	01006	Kintla Crk.
FBC	01007	Gyrfalcon L.
FBC	01008	U. Dutch L.
FBC	01009	Dutch Crk.
FBC	01010	Quartz Crk.
FBC	01011	Trail Crk.
FBC	01012	Whale Crk.
FBC	01013	Red Meadow Crk.
FBC	01014	N. Fk. Coal Crk.
FBC	01015	S. Fk. Coal Crk.
FBC	01016	Coal Crk. @ Deadhorse Brg.
FBC	01017	Upper Big Crk.
FBC	01018	Lower Big Crk.
FBC	01019	N. Fk Flathead River @ Canyon Crk.
FBC	02001	S. Fk. Flathead River
FBC	02002	Upper Whitcomb Crk.
FBC	02003	Lower Whitcomb Crk.
FBC	02004	W. Fk. Whitcomb Crk.
FBC	02005	Spotted Bear Crk.
FBC	02006	S. Fk Flathead River @ Twin Crk.
FBC	02007	S. Fk. Flathead River @ Spotted Bear
FBC	02008	Sullivan Crk.
FBC	02009	Hungry Horse Crk.
FBC	02010	Hungry Horse Reservoir
FBC	02011	S. Fk. Flathead River near Columbia Falls
FBC	03001	Snyder Lake
FBC	03002	Beaver Woman Lake
FBC	03003	Ole Crk.
FBC	03004	McDonald Crk. @ Apgar
FBC	03005	McDonald Lake
FBC	03006	Challenge Crk.
FBC	03007	Wounded Buck Crk.
FBC	03008	Morrison Crk.
FBC	03009	Lodgepole Crk.

Table 1. (continued)

PREFIX	NUMBER	LOCATION
FBC	03010	Granite Crk.
FBC	03011	M. Fk. Flathead River @ Bear Crk.
FBC	03012	M. Fk. Flathead River @ W. Glacier
FBC	03013	M. Fk. Flathead River @ Blankenship
FBC	04001	Stillwater River @ Olney
FBC	04002	Gregg Crk.
FBC	04003	Fish Crk.
FBC	04004	Hand Crk.
FBC	04005	Squaw Meadows Crk.
FBC	04006	Trib. Squaw Meadows Crk.
FBC	04007	Logan Crk. @ Tally Lake
FBC	04008	Tally Lake
FBC	04009	Fitzsimmons Crk.
FBC	04010	Chepat Crk.
FBC	04011	Stillwater River
FBC	04012	W. Fk. Swift Crk.
FBC	04013	E. Fk. Swift Crk.
FBC	04014	Chicken Crk.
FBC	04015	Swift Crk.
FBC	04016	Swift Crk. @ Whitefish Lake
FBC	04017	Lazy Crk. @ Whitefish Lake
FBC	04018	Whitefish Lake @ Midlake Deep
FBC	04019	Whitefish River @ Lake Outlet
FBC	04020	Whitefish River
FBC	04021	Whitefish River
FBC	04022	Stillwater River below Spring Crk.
FBC	05001	Flathead River @ Columbia Falls
FBC	05002	L. Blaine
FBC	05003	Ashley Crk @ Somers Stage Rd. Bridge
FBC	05004	Ashley Lake
FBC	05005	Ashley Crk. @ Ashley Lake Outlet
FBC	05006	Ashley Crk. @ Meridian Bridge
FBC	05007	Flathead River @ Brenneman Slough
FBC	05008	Flathead River @ Kokanee Bend
FBC	05009	Flathead River @ House of Mystery
FBC	05010	Green Mt. Crk
FBC	05011	Echo Lake
FBC	05012	Flathead River @ Holt
FBC	05013	Flathead Lake @ Somers
FBC	05014	Flathead Lake @ Midlake Deep
FBC	05015	Fish Crk.
FBC	05016	Crane Crk.
FBC	05017	Roy's Crk.
FBC	05018	Stoner Crk.
FBC	05019	Lake Mary Ronan
FBC	05020	Yellow Bay Crk.
FBC	05021	Flathead River @ Lake Outlet in Polson
FBC	05022	Flathead River @ Kerr
FBC	05023	Flathead River @ Perma
FBC	05027	Ashley Crk. @ Schoolhouse
FBC	05028	Ashley Crk. @ Hwy 93 Bridge
FBC	06001	Swan River @ Condon
FBC	06002	Lion Crk.

Table 1. (continued)

PREFIX	NUMBER	LOCATION
FBC	06003	Goat Crk.
FBC	06004	Elk Crk.
FBC	06005	Squeezer Crk.
FBC	06006	Krause Crk.
FBC	06007	Swan Lake
FBC	06008	Swan River @ Porcupine Crk.
FBC	06009	Swan River @ Bigfork
FBC	06010	Swan River near Bigfork
FBC	09001	Post Crk. above McDonald Lake
FBC	09002	Mission Crk. above Mission Reservoir
FBC	09003	Mission Crk. @ Flathead River
FBC	11001	Jocko River
FBC	11002	Jocko River @ Flathead River
FBC	12001	Little Bitterroot River
FBC	12002	Little Bitterroot River @ Flathead R.
FBC	13001	Sky Lake
FBC	13002	Medicine Grizzly Lake
FBC	13003	Gunsight Lake
FBC	13004	Stoney Indian Lake
FBC	13005	Swift Current Lake
FBC	13006	St. Mary's Lake
FBC	13007	Waterton Lake
FBC	13008	Two Medicine Lake
FBC	13009	Cobalt Lake

SECTION A

WATER QUALITY

Part I.

Water Quality Data Collected by the Flathead Lake Biological Station, University of Montana, Polson, MT 59860.

INTRODUCTION

The Flathead Lake Biological Station has been able to monitor a variety of important variables relating to water quality in Flathead Lake and its tributaries since 1977. The earlier data were collected as a part of the Flathead River Basin Environmental Impact Study funded by the Environmental Protection Agency (Henry and Stanford 1983, Stanford et al. 1983). Since 1983, the monitoring effort has been funded by a consortium including Flathead and Lake Counties, Confederated Salish and Kootenai Tribes, Montana Power Company and the Flathead Basin Commission. This effort has followed the guidelines established in the **Master Plan for Monitoring Water Quality in the Flathead River Basin (Flathead Basin Commission 1985)** and is one of the important data bases for the limnological research program at the Biological Station.

The complete nutrient (1977-1986) and organics and metals (1984-1986) water quality data set (Section A - Part I) and the limnological data set (Section B) for sites specified in the **Master Plan** are included herein without detailed interpretation. Various reports and journal papers which use these data to draw conclusions about the limnology of the Flathead system are given in a bibliography at the end of this section. The limnology of Flathead Lake, including updated nutrient loads and information on phosphorus bioavailability, are given in Ellis et al. (1985) and Ellis and Stanford (1986).

The Biological Station has also monitored water quality at many other locations in the Flathead Basin. Several of these sites are included in the **Master Plan** and are monitored by the Biological Station under a cooperative agreement with the National Park Service (Stanford et al. 1985a, Ellis et al. 1986). Data collected at other sites are not included in the **Master Plan** and are therefore not reported here. These data are computer filed at the Biological Station and/or reported in various papers listed in the bibliography.

The data included in Section A - Part I and all of Section B are the basis for the ongoing limnological research at the Biological Station. Presentation of these data herein does not constitute publication, and the data are subject to possible revision until they appear in reviewed journal papers. Our objective in this report is simply to provide the data in raw form as evidence of work done by the Biological Station in accordance with the **Master Plan.**

METHODS

Water samples for laboratory analyses were collected as grab samples at prescribed field sites. These were returned to the Biological Station within a prescribed time (Stanford et al. 1985b) for analyses.

The analytical data reported below were collected in accordance with EPA approved procedures given in detail in Stanford et al. (1985b). Chemical analyses were performed in the Freshwater Research Laboratory and under an EPA approved quality assurance program. Briefly, the QA program consisted of acceptance criteria of no more than 1 standard deviation of replicated analyses (i.e. for precision) and no more than 10 percent deviation from 100 percent recovery of sample spikes (i.e. for accuracy).

Limnological measures (plankton counts, primary productivity, chlorophyll concentrations) followed methods given by Ellis et al. (1985), (see Section B for Results).

RESULTS

All of the monitoring data pertaining to Flathead Lake and collected through September 1986 are included in Tables A.I.1. through A.I.40. In addition, data are tabulated for site FBC01001, the North Fork of the Flathead River at the International Border, and FBC01007, Gyrfalcon Lake, in the Quartz drainage of Glacier National Park. These two sites were included as representative of data collected by the Biological Station in cooperation with the Park Service. Data for other lakes in Glacier National Park are included in Stanford et al. (1985a) and Ellis et al. (1986).

DISCUSSION AND CONCLUSIONS

The data have not been exhaustively analyzed and, although the phosphorus mass balance calculations for Flathead Lake have been updated in Ellis and Stanford (1986), detailed interpretation of the database remains to be done.

However, a number of important, albeit preliminary, conclusions may be drawn from the data in Tables A.I.1 - A.I.40.

1. Ashley Creek and the Kalispell Sewage Treatment Plant remain the major source of nutrients (on a unit volume basis) entering the Flathead River and, hence, Flathead Lake;

2. however, note that water quality is generally poor in Ashley Creek above the sewage treatment plant;

3. Stoner Creek is carrying an unusually high (i.e. compared to other creeks in the Basin) nutrient load, probably as a result of pollution from septic contaminated groundwaters in the Lakeside area (see also Jourdonnais and Stanford 1985);

4. the airshed remains a major source of nutrients entering Flathead Lake, based on analyses of bulk precipitation collected at Yellow Bay;

5. no significant pollution problems have been detected in Glacier National Park; the lakes in the Park are very pristine, especially those in the backcountry; most of the lakes and streams in the Park contain few ions and may be expected to be very sensitive to any future pollution from the airshed or other sources (note data for Gyrfalcon Lake, see also Stanford et al. 1983, Stanford et al. 1985a and Ellis et al. 1986); Park waters exert a dilution effect on the higher ion concentrations measured in the North Fork at the International Boundary;

6. based on the entire data (1977-1986) set for the main sampling site on Flathead Lake (Tables A.I.20 through A.I.35, midlake deep), the long term average TN:TP is 18.5:1, which strongly supports the conclusion (Stanford et al. 1983) that algal production in the pelagic zone of Flathead Lake is phosphorus limited; however, late summer nitrate depletion in the epilimnion is evident most years, underscoring the need to study nutrient loads on a seasonal basis (now in progress at the Biological Station) and,

7. both the zooplankton and phytoplankton communities (see Section B) in Flathead Lake are changing in comparison to data collected prior to 1983 (cf. Stanford et al. 1983); this is very likely due to the establishment of *Mysis relicta*, which have become very abundant (> 150/m^2 in 1986) in the lake since first found in 1981 (Bob Bukantis, FLBS, unpublished data).

Table A.I.1. North Fork Flathead River at International Border. Flathead Basin Commission site # FBC01001. Concentrations (ug/l) of nutrients and selected physical variables.

Sample #	Date Coll	TP	SP	SRP	Turb.	TSS	NO_2	NO_3	TKN
FRS 3126	810318	5.6	NR	<1.0	NR	NR	NR	<10	40
FRS 3136A	810421	55.0	NR	1.1	NR	29.8	NR	NR	NR
FRS 3141	810514	15.1	NR	2.6	NR	12.8	NR	<10	90
FRS 3145	810611	21.7	NR	3.4	NR	14.2	NR	<10	89
FRS 3167	820412	5.6	NR	1.0	.60	1.6	<3.0	<20	LE
FRS 3172	820428	14.8	NR	2.3	3.40	11.4	<1.5	<20	NR
FRS 3176A	820510	10.1	NR	1.6	2.00	6.8	<1.0	<20	NR
FRS 3179	820606	35.6	NR	2.0	.00	107.0	<1.0	20	NR
FRS 3180	820809	6.9	NR	1.0	.40	1.2	<1.0	<20	NR
FRS 3181A	821031	3.7	NR	<1.0	.30	NR	<1.0	NR	NR
FRS 3186	821222	4.8	NR	1.0	.30	1.4	NR	68	NR
FRS 3187A	830206	4.1	NR	<1.0	.70	1.3	NR	<20	NR
FRS 3188	830308	6.3	NR	<1.0	.50	.7	NR	<20	NR
FRS 3189	830407	3.9	NR	<1.0	.50	1.6	NR	<20	NR
FRS 3190	830607	47.4	NR	3.7	10.00	43.4	NR	<20	NR
FRS 3191	830629	13.5	NR	1.7	2.80	11.6	NR	<20	NR
FRS 3192	830804	22.5	NR	<1.0	2.20	26.2	NR	<20	NR
FRS 3193	830901	6.5	NR	<1.0	.70	1.0	NR	<20	NR
FRS 3194	831006	3.6	NR	<1.0	.40	.8	NR	<20	NR
FRS 3195	840304	8.8	4.6	<1.0	.90	NR	NR	<20	40
FRS 3196	840401	3.4	4.1	NR	1.00	NR	NR	NR	NR
GNP 1270	840429	9.0	3.4	<1.0	1.10	4.5	NR	<20	66
GNP 1276	840603	26.4	4.8	2.6	9.50	34.4	NR	<20	95
GNP 1281	840702	12.0	3.6	1.8	2.60	9.4	NR	<20	70
GNP 1301	840805	3.0	<1.0	<1.0	.30	NR	NR	<20	44
GNP 1303	840902	3.4	<1.0	<1.0	.40	NR	NR	<20	49
GNP 1319	840930	4.8	2.3	<1.0	.50	NR	NR	<20	29
GNP 1330	841106	5.9	3.6	<1.0	.50	NR	NR	<20	LE
GNP 1333	841208	9.8	2.4	<1.0	.90	NR	NR	<20	44
GNP 1336	850113	4.1	2.4	1.0	.50	NR	NR	28	24
GNP 1339	850218	2.6	1.9	<1.0	.40	NR	NR	17	13
GNP 1344	850310	4.2	2.5	<1.0	.20	NR	NR	34	29
GNP 1347	850329	4.7	2.2	<1.0	.70	NR	NR	50	NR
GNP 1350	850506	43.2	5.4	3.1	16.00	56.2	NR	35	111
GNP 1353	850604	17.4	6.6	3.4	2.30	12.6	NR	<20	58
GNP 1354	850618	12.3	4.9	2.5	1.70	9.5	NR	<20	56
GNP 1360	850630	7.6	4.1	2.2	1.80	5.0	NR	<10	43
GNP 1370	850715	7.1	3.5	1.1	.50	2.2	NR	<10	27
GNP 1374	850804	6.3	3.0	1.1	1.20	1.6	NR	<10	26
GNP 1377	850915	10.5	3.1	<1.0	2.20	2.3	NR	<10	59
GNP 1387	851007	4.0	1.5	<1.0	.60	<.5	NR	<10	6
NFS 0003	860420	11.2	3.9	1.6	NR	8.7	NR	<1	NR
NFS 0004	860420	7.9	3.7	1.3	NR	6.3	NR	<1	NR
NFS 0083	860504	57.3	5.8	3.3	21	NR	NR	39	182
NFS 0088	860518	14.7	4.1	1.3	3.7	16.2	NR	<1	95
NFS 0126	860528	22.0	12.4	7.9	.83	LE	NR	NR	506
NFS 0213	860608	32.9	7.9	5.2	9.5	NR	NR	<10	108
NFS 0251	860623	11.3	3.5	1.9	3.1	11.8	NR	<10	54
NFS 0276	860811	5.0	3.4	<1.0	.41	4.3	NR	<10	38

Sample # = FLBS Freshwater Research Laboratory number.
Date Coll = Date collected.
TP = Total Phosphorus (PO_4-P).
SP = Soluble Phosphorus (PO_4-P).
SRP = Soluble Reactive Phosphorus (PO_4-P).
Turb. = Turbidity.
TSS = Total Suspended Solids.
NO_2 = Nitrite Nitrogen.
NO_3 = Nitrate Nitrogen.
TKN = Total Kjeldahl Nitrogen.

Table A.I.2. North Fork Flathead River at International Border. Flathead Basin Commission site # FBC01001. Concentrations (ug/l) of organics and selected physical variables.

Sample #	Date Coll	pH	Cond.	Alk.	NDOC	DOC	DIC	Cl	SO_4
FRS 3194	831006	NR	NR	NR	LE	LE	NR	.10	4.78
FRS 3195	840304	8.28	NR	142	.06	.44	NR	NR	NR
FRS 3196	840401	8.25	NR	143	NR	NR	NR	NR	NR
GNP 1270	840429	8.31	NR	122	.12	1.28	NR	NR	NR
GNP 1276	840603	8.13	NR	100	.47	1.87	7.27	NR	NR
GNP 1281	840702	8.13	NR	120	.25	1.53	NR	.12	3.33
GNP 1301	840805	8.46	NR	152	.18	2.46	NR	.10	4.49
GNP 1303	840902	8.25	NR	126	.16	1.80	NR	.27	4.72
GNP 1319	840930	8.35	232	143	.05	.85	NR	NR	NR
GNP 1330	841106	8.20	NR	148	.10	.61	NR	NR	NR
GNP 1333	841208	7.95	NR	144	.22	.36	NR	NR	NR
GNP 1336	850113	8.26	NR	146	.04	1.08	NR	NR	NR
GNP 1339	850218	8.12	NR	150	.04	.16	NR	NR	NR
GNP 1344	850310	8.27	NR	149	.05	.40	NR	.28	0
GNP 1347	850329	8.36	NR	144	.08	.56	NR	.84	13.50
GNP 1350	850506	8.04	NR	99	.52	2.96	NR	NR	NR
GNP 1353	850604	8.27	NR	94	.30	1.82	NR	NR	NR
GNP 1354	850618	8.31	NR	102	.21	1.80	NR	NR	NR
GNP 1360	850630	8.52	NR	122	.14	1.06	NR	NR	NR
GNP 1370	850715	8.35	NR	123	.11	.96	NR	NR	NR
GNP 1374	850804	7.95	NR	136	.15	1.28	NR	NR	NR
GNP 1377	850915	8.17	NR	124	.12	1.80	NR	NR	NR
GNP 1387	851007	8.36	NR	140	.11	.79	NR	NR	NR

Cond. = Conductivity umhos.
Alk. = Alkalinity.
NDOC = Non-dissolved Organic Carbon.
DOC = Dissolved Organic Carbon.
DIC = Dissolved Inorganic Carbon.
Cl = Chloride.
SO_4 = Sulfate.

Table A.I.3. North Fork Flathead River at the International Border. Flathead Basin Commission site # FBC01001. Concentrations (ug/l) of metals.

Sample #	Date	Ca	Mg	Na	K	Fe	Al	Ba	Mo	Pb	Zn
FRS 3194	831006	52.16	11.75	.71	.32	<.10	NR	NR	NR	NR	NR
FRS 3195	840304	NR	NR	NR	NR	<.10	174	78	LE	8	LE
FRS 3196	840401	NR	NR	NR	NR	<.10	38	76	LE	1	LE
GNP 1270	840429	NR	NR	NR	NR	NR	42	72	<1.0	<1.0	1.9
GNP 1276	840603	NR	NR	NR	NR	NR	78	56	<1.0	<1.0	3.2
GNP 1281	840702	7.24	35.15	.68	.27	NR	24	58	<1.0	<1.0	NR
GNP 1301	840805	NR	NR	NR	NR	<.10	18	59	<1.0	<1.0	1.2
GNP 1303	840902	NR	NR	NR	NR	<.10	12	81	<1.0	<1.0	1.1
GNP 1319	840930	NR	NR	NR	NR	<.10	35	104	<1.0	<1.0	<1.0
GNP 1330	841106	NR	NR	NR	NR	<.10	84	61.0	<1.0	<1.0	1.5
GNP 1333	841208	46.38	8.84	.85	.30	<.10	87	58.0	<1.0	<1.0	1.0
GNP 1336	850113	NR	NR	NR	NR	<.10	30	63.6	<1.0	6.0	4.5
GNP 1339	850218	NR	NR	NR	NR	<.10	75	65.6	<1.0	1.6	1.5
GNP 1344	850310	NR	NR	NR	NR	<.10	26.9	61.8	<1.0	<1.0	<1.0
GNP 1347	850329	NR	NR	NR	NR	<.10	55.9	67.5	<1.0	1.2	1.2
GNP 1350	850506	NR	NR	NR	NR	<.10	158.7	53.8	<1.0	<1.0	1.0
GNP 1353	850604	NR	NR	NR	NR	<.10	117.7	47.0	<1.0	<1.0	<1.0
GNP 1354	850618	NR	NR	NR	NR	<.10	42.9	57.3	<1.0	<1.0	<1.0
GNP 1360	850630	NR	NR	NR	NR	<.10	24.6	64.9	<1.0	1.3	<1.0
GNP 1370	850715	NR	NR	NR	NR	<.10	4.0	74.5	<1.0	1.2	2.5
GNP 1374	850804	NR	NR	NR	NR	<.10	43.5	79.2	<1.0	2.8	<1.0
GNP 1377	850915	NR	NR	NR	NR	<.10	27.8	54.8	<1.0	1.3	LE?
GNP 1387	851007	NR	NR	NR	NR	<.10	37.5	40.2	<1.0	<1.0	<1.0

Table A.I.4. Gyrfalcon Lake, Glacier National Park. Flathead Basin Commission # FBC01007. Concentrations (ug/l) of selected nutrient and physical variables.

Date	TP	SP	SRP	NO_2	NO_3	NH_3	TKN	TN	pH	CND	ALK	TU
820606	LE	NR	NR	NR	75	NR	NR	NR	NR	NR	NR	.68
820920	1.5	NR	<1.0	NR	<20	NR	NR	NR	7.53	NR	15	.22
830816	2.0	<1.0	<1.0	NR	<20	NR	NR	NR	7.51	28	13	.53
830816	2.7	<1.0	<1.0	NR	<20	NR	NR	NR	7.74	28	15	.50
830816	3.1	1.8	<1.0	NR	<20	NR	NR	NR	7.62	31	15	.52
830928	6.0	2.4	<1.0	NR	<20	NR	NR	NR	7.03	34	16	.34
840714	3.6	2.7	1.3	<.2	82	LE	18	NR	6.84	19	10	.19
840928	3.3	1.1	<1.0	.3	5	<5	57	67	7.25	33	25	.35
850729	3.1	<1.0	<1.0	.4	20	9	20	49	7.09	31	13	.35
851010	4.4	1.6	1.0	.2	17	13	103	133	7.31	42	21	.30
860829	2.9	1.2	<1.0	.3	<10	9	54	73	7.39	27	15	.29
mean	3.3	1.4	<1.0	.3	30	9	49	81	7.33	30	16	

Table A.I.5. Stillwater River below confuence of Whitefish River. Flathead Basin Commission site # FBC04022. Concentrations (ug/l) of selected nutrients and physical variables.

Sample #	Date Coll	TP	SP	SRP	Turb.	TSS	NO_2	NO_3	NH_3	TKN
FMP 0003	840131	69.8	54.1	42.8	2.90	NR	LE	278	NR	369
FMP 0013	840305	31.1	22.7	16.4	1.80	NR	1.7	224	NR	175
FMP 0023	840402	16.5	15.4	6.8	5.70	NR	1.1	73	NR	173
FMP 0041	840429	21.7	7.6	5.0	3.70	15.1	.8	69	NR	190
FMP 0051	840514	20.7	7.1	1.6	4.20	15.6	.8	44	NR	212
FMP 0061	840520	28.8	5.8	3.0	10	24.3	.6	32	NR	101
FMP 0087	840806	18.0	LE?	5.8	1.60	NR	.8	31	NR	134
FMP 0097	840904	17.3	11.0	6.8	1.10	NR	.9	50	NR	147
FMP 0108	841003	17.2	17.2	8.9	1.20	NR	1.0	89	NR	95
FMP 0118	841112	20.6	16.5	11.8	1.00	NR	1.3	115	NR	105
FMP 0129	841209	24.7	18.0	11.8	.80	NR	1.9	184	NR	108
FMP 0140	850106	26.0	23.3	18.3	.70	NR	1.7	251	NR	166
FMP 0152	850210	40.8	34.4	27.5	1.20	NR	1.9	290	NR	186
FMP 0163	850304	36.8	26.5	23.8	1.70	NR	1.7	240	NR	197
FMP 0191	850401	68.9	37.4	31.2	15	12.2	2.6	262	NR	221
FMP 0200	850424	31.7	8.9	3.0	8.50	19.0	<.5	42	NR	143
FMP 0212	850512	31.4	8.6	1.9	7.90	17.1	<.5	17	NR	181
FMP 0221	850527	36.8	9.0	4.0	14	35.3	.7	25	NR	213
FMP 0233	850611	40.5	20.4	3.5	2.50	25.2	.0	24	NR	164
FMP 0250	850630	26.2	10.7	3.6	3.70	6.4	.5	32	NR	144
FMP 0261	850729	23.0	9.9	4.1	2.30	NR	.7	52	NR	157
FMP 0272	850826	LE?	10.6	6.4	.90	NR	1.2	65	NR	70
FMP 0283	850909	20.1	14.7	10.2	1.50	1.9	1.1	82	NR	128
FMP 0299	851006	16.1	10.1	6.4	1.20	NR	1.6	109	NR	128
FMP 0313	851111	16.3	10.0	5.4	2.10	NR	1.0	64	NR	137
FMP 0325	851209	22.6	15.4	11.7	1.30	NR	1.7	189	NR	150
FMP 0336	860106	27.3	19.7	16.4	1.90	NR	2.0	238	NR	160
FMP 0349	860203	33.4	27.8	18.7	2.00	NR	2.2	216	NR	156
FMP 0365	860303	62.8	47.0	39.5	3.70	NR	3.8	259	NR	430
FMP 0378	860331	32.4	10.9	4.3	13	28.7	.7	99	NR	220
FMP 0390	860414	21.2	10.3	2.1	7.30	16.4	.3	48	NR	168
FMP 0402	860428	19.0	5.9	2.1	5.40	14.2	.4	40	NR	174
FMP 0416	860512	24.2	7.9	2.8	9.30	19.0	.5	36	NR	180
FMP 0428	860603	29.8	7.4	3.8	12	27.6	.7	34	NR	185
FMP 0446	860616	22.2	7.1	3.1	3.40	9.6	.4	56	NR	148
FMP 0457	860630	21.0	9.5	5.9	3.00	9.0	.7	66	NR	144
FMP 0468	860728	17.8	9.6	5.1	2.10	NR	.8	76	5	160
FMP 0485	860902	28.1	21.4	14.3	2.10	NR	1.6	117	7	168

Table A.I.6. Stillwater River below confluence of Whitefish River. Flathead Basin Commission site # FBC04022. Concentrations (ug/l) of selected organics and physical variables.

Sample #	Date Coll	pH	Cond.	Alk.	NDOC	DOC	DIC	SiO_2
FMP 0003	840131	8.10	243	133	.41	2.12	NR	10.5
FMP 0013	840305	8.14	NR	148	.27	1.71	NR	9.1
FMP 0023	840402	8.15	227	171	.64	5.52	NR	9.3
FMP 0041	840429	8.14	179	111	.55	1.30	NR	9.4
FMP 0051	840514	8.13	191	117	.55	2.03	NR	8.8
FMP 0061	840520	8.09	185	114	.75	2.94	22.81	9.8
FMP 0087	840806	8.38	220	136	.43	3.25	28.89	10.3
FMP 0097	840904	8.14	223	134	.39	2.17	29.30	7.8
FMP 0108	841003	8.12	218	126	.26	1.33	33.30	7.7
FMP 0118	841112	8.11	235	142	.19	1.44	32.29	9.6
FMP 0129	841209	7.99	264	152	.22	1.48	33.78	9.1
FMP 0140	850106	8.15	263	150	.19	1.78	32.85	10.6
FMP 0152	850210	8.19	281	153	.22	1.17	36.53	9.3
FMP 0163	850304	8.20	275	154	.38	1.51	34.90	10.6
FMP 0191	850401	8.13	272	151	.60	2.05	NR	9.2
FMP 0200	850424	8.26	193	108	.46	4.00	NR	10.9
FMP 0212	850512	8.11	160	105	.45	3.06	NR	10.5
FMP 0221	850527	8.08	176	98	.46	2.40	25.70	8.5
FMP 0233	850611	8.15	157	97	.54	1.74	25.00	10.0
FMP 0250	850630	7.81	192	100	.39	2.21	25.00	8.2
FMP 0261	850729	8.31	231	124	.38	1.55	24.90	8.8
FMP 0272	850826	8.31	236	135	.30	2.02	32.00	8.1
FMP 0283	850909	8.23	225	142			32.80	8.1
FMP 0299	851006	8.18	242	139			32.20	4.1
FMP 0313	851111	8.15	190	115				10.2
FMP 0325	851209	8.00	239	135				10.0
FMP 0336	860106	8.11	260	145				10.7
FMP 0349	860203	8.18	253	140				10.1
FMP 0365	860303	8.10	256	143				11.5
FMP 0378	860331	8.15	223	125				10.7
FMP 0390	860414	8.15	203	114				10.8
FMP 0402	860428	8.18	204	117				8.2
FMP 0416	860512	8.17	204	114				10.7
FMP 0428	860603	8.21	192	105				9.0
FMP 0446	860616	8.33	209	115				8.5
FMP 0457	860630	8.20	217	124				8.8
FMP 0468	860728	8.43	240	137				10.1
FMP 0485	860902	8.29	237	144				8.5

Table A.I.7. Stillwater River below confluence of Whitefish River. Flathead Basin Commission site # FBC04022. Concentrations (ug/l) of selected metals.

Sample #	Date Coll	Ca	Mg	Fe
FMP 0003	840131	40.07	11.36	<.10
FMP 0013	840305	41.31	12.16	.11
FMP 0023	840402	38.91	9.91	.11
FMP 0041	840429	31.73	7.57	<.10
FMP 0051	840514	33.44	7.80	<.10
FMP 0061	840520	33.04	8.25	.14
FMP 0087	840806	33.07	8.46	<.10
FMP 0097	840904	37.80	9.60	<.10
FMP 0108	841003	36.72	10.34	<.10
FMP 0118	841112	36.10	9.90	<.10
FMP 0129	841209	42.90	10.27	.10
FMP 0140	850106	42.27	9.98	<.10
FMP 0152	850210	47.11	10.73	<.10
FMP 0163	850304	41.41	10.74	.11
FMP 0191	850401	42.47	10.93	.12
FMP 0200	850424	33.46	7.33	<.10
FMP 0212	850512	33.97	7.04	<.10
FMP 0221	850527	30.41	6.08	<.10
FMP 0233	850611	28.00	6.65	<.10
FMP 0250	850630	32.08	7.50	<.10
FMP 0261	850729	33.05	9.66	<.10
FMP 0272	850826	36.20	10.00	<.10
FMP 0283	850909	37.40	10.27	<.10
FMP 0299	851006	43.82	10.75	<.10
FMP 0313	851111	36.45	8.67	<.10
FMP 0325	851209	43.82	10.55	<.10
FMP 0336	860106	46.67	10.67	<.10
FMP 0349	860203	41.31	9.57	<.10
FMP 0365	860303	44.41	11.23	<.10
FMP 0378	860331	38.59	9.60	<.10
FMP 0390	860414	36.80	8.42	<.10
FMP 0402	860428	34.28	8.41	<.10
FMP 0416	860512	34.28	7.90	<.10
FMP 0428	860603	31.95	6.52	<.10
FMP 0446	860616	26.10	6.33	<.10
FMP 0457	860630	36.34	8.62	<.10
FMP 0468	860728			
FMP 0485	860902			

Table A.I.8. Ashley Creek at Flathead Basin Commission sites as specified. Concentrations (ug/l) of nutrients and selected physical variables.

Site #	Date Co	TP	SP	SRP	Turb.	TSS	NO2	NO3	NH3	TKN
FBC05003	840131	486.3	344.6	343.0	29.0	NR	NR	402	NR	1752
FBC05003	840305	383.0	247.3	284.5	4.7	NR	4.3	330	NR	1899
FBC05003	840402	LE?	1050.5	910.8	12.5	NR	15.7	289	340	1309
FBC05003	840429	212.9	127.6	108.4	16.0	32.3	13.3	231	NR	896
FBC05003	840514	181.1	149.5	141.3	7.4	21.8	35.8	319	NR	1180
FBC05003	840520	270.6	263.4	238.0	11.5	26.0	42.7	355	NR	1246
BSC05022	840628	NR	152.4	33.6	NR	NR	NR	<20	NR	NR
BSC05023	840628	NR	345.2	321.6	NR	NR	NR	118	NR	NR
FBC05003	840806	1044.0	1018.0	918.9	1.0	NR	178.1	27	NR	704
BSC05022	840820	NR	26.5	17.3	NR	NR	NR	<20	NR	NR
BSC05023	840820	NR	670.0	367.0	NR	NR	NR	33	NR	NR
FBC05027	840904	707.0	691.1	641.6	2.7	NR	205.2	1986	NR	877
FBC05027	841003	543.6	534.0	501.6	6.4	NR	28.3	1631	NR	634
BSC05022	841010	NR	17.9	3.0	NR	NR	NR	<20	NR	NR
BSC05023	841010	NR	933.3	860.5	NR	NR	NR	488	NR	NR
BSC05026	841016	NR	702.9	689.5	NR	NR	NR	932	NR	NR
FBC05027	841112	383.2	395.4	369.9	4.7	NR	12.2	828	NR	1406
FBC05027	841209	913.1	919.1	883.3	3.9	NR	2.4	821	NR	3149
BSC05022	841212	NR	17.3	7.8	NR	NR	NR	83	NR	NR
BSC05023	841212	NR	1329.0	1300.0	NR	NR	NR	157	NR	NR
BSC05026	841218	NR	604.2	586.0	NR	NR	NR	481	NR	NR
FBC05027	850106	1014.0	1023.3	986.8	7.2	NR	2.6	754	NR	3736
FBC05027	850210	913.4	870.1	888.5	8.6	NR	2.3	635	NR	3697
BSC05026	850228	NR	668.7	658.9	NR	NR	NR	642	NR	NR
BSC05022	850228	NR	43.2	36.3	NR	NR	NR	208	NR	NR
BSC05023	850228	NR	805.5	728.7	NR	NR	NR	230	NR	NR
FBC05027	850304	791.9	759.2	741.6	10.2	NR	3.9	486	NR	3326
BSC05022	850401	111.0	72.8	48.2	11.0	16.4	3.0	189	NR	651
FBC05027	850401	328.5	237.1	183.5	13.0	23.1	4.9	391	NR	2273
BSC05022	850423	NR	35.8	6.6	NR	NR	NR	37	NR	NR
BSC05023	850423	NR	213.9	189.2	NR	NR	NR	71	NR	NR
FBC05027	850424	401.4	329.8	297.1	18.0	39.3	1.8	142	NR	1364
FBC05027	850512	564.0	569.3	539.1	13.0	33.8	4.0	391	NR	1987
BSC05022	850527	53.6	38.6	16.6	4.1	7.5	.9	<20	NR	606
FBC05027	850527	310.4	260.7	223.4	9.2	15.8	93.4	766	NR	1224
FBC05027	850611	362.6	319.1	274.9	4.2	33.6	4.0	305	NR	1345
FBC05027	850630	311.9	277.2	241.6	8.6	15.1	81.7	781	NR	1719
FBC05027	850729	1680.0	2005.5	1970.2	3.3	NR	197.1	2841	NR	1267
FBC05028	850813	1000.8	905.9	839.0	1.6	NR	173.2	1974	NR	2448
BSC05022	850909	41.1	30.1	16.9	3.7	6.4	.7	<10	NR	408
FBC05027	850909	606.2	655.1	594.2	2.7	4.0	71.5	1500	NR	1366
FBC05028	851006	320.0	269.4	270.5	7.2	NR	8.2	624	NR	1244
FMP05028	851111	340.0	369.6	314.6	6.9	NR	3.8	345	NR	1811
FBC05027	851209	419.4	411.5	390.8	6.9	NR	3.4	474	NR	1879
FBC05027	860106	604.2	586.3	575.9	6.5	NR	3.9	476	NR	2307
FBC05027	860203	385.8	NR	NR	8.0	10.0	6.6	430	NR	NR
FBC05028	860203	343.1	280.4	259.8	6.6	5.0	13.0	451	NR	2028
FBC05028	860303	462.3	411.8	390.4	44.0	NR	23.5	405	NR	1978
FBC05027	860331	156.5	83.8	61.3	22.0	70.9	5.3	113	266	1237
FBC05027	860414	173.9	86.4	69.3	20	58.8	3.5	61	157	1017
FBC05027	860428	138.4	101.5	78.6	17	46.3	5.2	94	186	1007
FBC05027	860512	141.8	99.4	77.3	17	57.9	9.1	91	163	966
FBC05027	860603	251.8	186.4	175.1	6.4	17.5	56.8	246	176	993
FBC05027	860616	197.6	162.6	143.5	8.1	22.0	66.6	392	210	996
FBC05027	860630	191.8	182.6	166.5	4.4	8.9	65.6	738	241	858
FBC05027	860728	385.1	367.1	351.8	2.4	NR	80.2	1184	58	686
FBC05027	860902	415.0	388.6	380.5	3.0	NR	133.6	1799	75	769

Table I.A.9. Ashley Creek (see Table I.A.8. for cross reference of sample # and site #). Concentrations (ug/l) of organics and selected physical variables.

Sample #	Date Coll	pH	Cond.	Alk.	NDOC	DOC	DIC	SiO2
FMP 0001	840131	8.13	358	165	.99	5.52	NR	14.8
FMP 0011	840305	8.15	NR	212	1.15	4.80	NR	13.2
FMP 0021	840402	8.11	321	174	1.56	6.78	NR	9.5
FMP 0039	840429	8.14	234	113	2.96	11.79	NR	15.3
FMP 0049	840514	8.10	257	136	1.95	6.85	NR	13
FMP 0059	840520	8.23	757	125	2.25	8.92	23.63	12.8
FMP 0088	840806	7.84	367	173	.89	9.61	40.72	2.5
FMP 0098	840904	7.72	414	171	1.19	7.95	42.30	5.5
FMP 0109	841003	7.95	335	175	1.34	5.84	33	7
FMP 0119	841112	8.08	400	192	1.05	4.65	44.40	10.7
FMP 0130	841209	7.71	531	249	1.10	5.76	55.88	13.3
FMP 0141	850106	7.91	500	213	1.19	4.99	47.02	15.5
FMP 0153	850210	7.95	475	216	1.45	5.29	48.53	15.5
FMP 0164	850304	7.87	512	210	1.53	4.94	49	16.7
FMP 0186	850401	8.17	434	205	1.86	5.95	LE	14.8
FMP 0187	850401	8.24	345	181	1.22	6.12	LE	14.3
FMP 0201	850424	8.05	223	107	.78	10.91	LE	17.2
FMP 0210	850512	7.78	187	102	1.64	6.57	LE	16.2
FMP 0222	850527	8.33	198	105	.85	7.53	27.60	6.4
FMP 0223	850527	7.86	270	125	1.07	7.11	32.30	7.8
FMP 0234	850611	7.91	200	106	3.53	12.41	26.62	16.6
FMP 0251	850630	7.76	245	122	1.76	13.86	29.50	15.2
FMP 0262	850729	8	668	238	2.10	9.79	46.90	5.4
FMP 0273	850826	8.04	466	188	1.76	9.79	45.70	5.8
FMP 0284	850909	7.92	380	180			39.53	5.6
FMP 0294	850909	8.26	245	148			33.66	4.7
FMP 0300	851006	8.13	336	165			37.22	5.6
FMP 0314	851111	8.09	325	163				12
FMP 0326	851209	7.92	385	192				16.8
FMP 0337	860106	8.05	441	213				17.2
FMP 0350	860203	8.10	435	197				15.8
FMP 0359	860203	8.28	412	192				14.8
FMP 0366	860303	8.04	304	146				14.3
FMP 0379	860331	8.03	296	146				19.4
FMP 0391	860414	8.05	249	126				18.4
FMP 0403	860428	8.03	253	134				18.1
FMP 0417	860512	8.20	249	131				19.1
FMP 0429	860603	8.09	304	150				14.8
FMP 0447	860616	8.12	325	166				11.6
FMP 0458	860630	7.98	334	167				8.4
FMP 0469	860728	8.26	394	190				5.9
FMP 0486	860902	7.98	376	180				7.4

Table A.I.10. Ashley Creek at Flathead Basin Commission site # as specified. Concentration (ug/l) of selected metals.

Sample #	Site #	Date Col	Ca	Mg	Fe
FMP 0001	FBC05003	840131	41.94	15.15	.14
FMP 0011	FBC05003	840305	48.17	18.26	.21
FMP 0021	FBC05003	840402	42.33	14.23	.11
FMP 0039	FBC05003	840429	27.96	8.91	.25
FMP 0049	FBC05003	840514	34.12	10.51	.22
FMP 0059	FBC05003	840520	31.31	10.71	<.10
FMP 0088	FBC05003	840806	37.37	14.50	<.10
FMP 0098	FBC05027	840904	42.27	16.05	<.10
FMP 0109	FBC05027	841003	38.45	16.25	.10
FMP 0119	FBC05027	841112	39.32	15.43	.13
FMP 0130	FBC05027	841209	52.21	17.97	.10
FMP 0141	FBC05027	850106	55.13	16.13	<.10
FMP 0153	FBC05027	850210	51.48	15.15	.10
FMP 0164	FBC05027	850304	46.95	15.88	.15
FMP 0186	FBC05027	850401	45.90	17.92	.21
FMP 0187	FBC05022	850401	41.67	14.66	.18
FMP 0201	FBC05027	850424	26.85	8.70	.33
FMP 0210	FBC05027	850512	26.85	7.63	<.10
FMP 0222	FBC05022	850527	27.36	8.23	.17
FMP 0223	FBC05027	850527	29.82	9.87	.17
FMP 0234	FBC05027	850611	25.32	8.96	.14
FMP 0251	FBC05027	850630	30.73	10.49	.12
FMP 0262	FBC05027	850729	50.99	23.44	<.10
FMP 0273	FBC05028	850826	41.46	17.37	.13
FMP 0284	FBC05027	850909	36.90	16.47	.13
FMP 0294	BSC05022	850909	33.97	14.27	<.10
FMP 0300	FBC05028	851006	40.13	14.70	<.10
FMP 0314	FBC05028	851111	42.89	15	<.10
FMP 0326	FBC05027	851209	50.26	16	<.10
FMP 0337	FBC05027	860106	54.54	17.27	.10
FMP 0350	FBC05028	860203	46.51	15.13	.10
FMP 0359	FBC05027	860203	NR	NR	NR
FMP 0366	FBC05028	860303	34.12	13.49	.30
FMP 0379	FBC05027	860331	37.25	13.89	.30
FMP 0391	FBC05027	860414	31.88	11.95	.30
FMP 0403	FBC05027	860428	34.28	11.37	.10
FMP 0417	FBC05027	860512	33.82	10.68	.10
FMP 0429	FBC05027	860603	40.34	12.18	.10
FMP 0447	FBC05027	860616	30.60	10.50	.10
FMP 0458	FBC05027	860630	41.66	13.79	.10

Table A.I.11. Flathead River at Holt. Flathead Basin Commission site # FBC05012. Concentrations (ug/l) of selected nutrients and physical variables.

Sample #	Date	TP	SP	SRP	Turb.	TSS	NO_2	NO_3	NH_3	TKN
FLS 3845	771117	NR	NR	NR	NR	3.3	NR	NR	NR	37
FLS 4128	771220	6.1	NR	NR	NR	1.4	NR	NR	NR	174
FLS 4290	780125	3.4	NR	NR	NR	2.8	NR	131	NR	83
FLS XXX3	780215	NR	NR	NR	NR	4.9	NR	NR	NR	NR
FLS 4737	780301	3.0	NR	NR	NR	3.8	NR	70	NR	30
FLS 4738	780315	3.0	NR	NR	NR	2.8	NR	70	NR	20
FLS 4971	780418	15.0	NR	NR	NR	5.7	NR	100	NR	30
FLS 4992	780524	est	NR	NR	NR	152.0	NR	110	NR	20
FLS 5199	780615	est	NR	NR	NR	21.1	NR	20	NR	40
FLS 5178	780628	15.0	NR	NR	NR	7.2	NR	85	NR	70
FLS 5282	780712	14.0	NR	NR	NR	5.6	NR	85	NR	85
FLS 5312	780730	8.0	NR	NR	NR	2.0	NR	<10	NR	50
FLS 5337	780815	8.0	NR	NR	NR	2.7	NR	40	NR	70
FLS 5371	780830	12.0	NR	NR	NR	2.6	NR	30	NR	40
FLS 5387	780927	8.0	NR	NR	NR	1.8	NR	60	NR	40
FLS 5421	781030	8.0	NR	NR	NR	2.5	NR	40	NR	<40
FLS 5455	781130	8.0	NR	NR	NR	3.2	NR	<20	NR	60
FLS 5489	781218	12.0	NR	NR	NR	5.2	NR	110	NR	90
FLS 5536	790228	8.0	NR	NR	NR	2.3	NR	50	NR	170
FLS 5539	790331	10.0	NR	NR	NR	4.4	NR	40	NR	110
FLS 5573	790508	72.0	NR	NR	NR	24.9	NR	131	NR	NR
FLS 5607	790610	14.2	NR	NR	NR	20.2	NR	88	NR	NR
FLS 5654	790628	13.5	NR	NR	NR	8.6	NR	52	NR	NR
FLS 5688	790712	6.5	NR	NR	NR	2.4	NR	47	NR	NR
FLS 5722	790829	3.7	NR	NR	NR	2.3	NR	57	NR	NR
FLS 5761	790927	12.1	NR	NR	NR	5.7	NR	19	NR	NR
FLS 5764	791029	6.9	NR	NR	NR	2.1	NR	97	NR	NR
FLS 5767	791129	9.0	NR	NR	NR	2.2	NR	99	NR	NR
FLS 5770	800105	11.1	NR	NR	NR	2.7	NR	108	NR	NR
FLS 5773	800130	10.9	NR	NR	NR	5.5	NR	32	NR	NR
FLS 5776	800307	17.2	NR	NR	NR	4.4	NR	57	NR	NR
FLS 5779	800331	NR	NR	NR	NR	5.6	NR	120	NR	NR
FLS 5782	800428	25.0	NR	NR	NR	96.4	NR	142	NR	NR
FLS 5792	800501	NR	NR	NR	NR	92.5	NR	NR	NR	NR
FLS 5793	800505	36.5	NR	NR	NR	89.2	NR	111	NR	NR
FLS 5799	800512	14.3	NR	NR	NR	21.6	NR	79	NR	NR
FLS 5827	800527	276.0	NR	NR	NR	456.3	NR	82	NR	NR
FLS 5840	800626	7.0	NR	NR	NR	3.8	NR	44	NR	NR
FRS 3134	810409	19.5	NR	<1.0	NR	NR	NR	NR	NR	124
FLS 5974	810508	16.9	NR	2.3	NR	20.0	NR	70	NR	99
FLS 5982	810525	196.0	NR	4.6	NR	303.0	NR	74	NR	224
FLS 6005	810616	22.9	NR	1.8	NR	26.4	NR	56	NR	127
FLS 6011	810728	6.4	NR	NR	NR	1.8	NR	28	NR	88
FLS 6016	811006	5.2	NR	<1.0	NR	.9	NR	43	NR	87
FLS 6024	811111	7.6	NR	2.6	NR	.7	NR	50	NR	103
FLS 6027	811209	7.9	NR	3.1	NR	1.8	NR	70	NR	136
FLS 6029	820126	9.3	NR	2.9	NR	2.8	NR	60	NR	112
FLS 6034	820208	5.0	NR	1.2	NR	2.8	NR	55	NR	66
FLS 6038	820318	9.1	NR	2.7	NR	2.5	NR	63	NR	NR
FLS 6042	820420	14.7	NR	<1.0	1.70	6.2	NR	46	NR	NR

Table A.I.11. (continued)

FLS	6048	820504	48.2	NR	1.3	8.60	77.3	NR	62	NR	NR
FLS	6056	820525	121.0	NR	1.9	615.00	255.0	NR	110	NR	NR
FLS	6058	820610	18.2	NR	18.9	7.40	21.0	NR	78	NR	NR
FLS	6064	820713	7.4	NR	<1.0	NR	4.9	NR	44	NR	NR
FLS	6070	820809	8.0	NR	<1.0	1.20	NR	NR	<20	NR	NR
FLS	6075	820907	7.7	NR	<1.0	.65	NR	NR	<20	NR	NR
FLS	6080	821101	7.0	NR	1.3	.90	NR	<1.0	47	NR	NR
FLS	6086	821206	6.7	NR	2.6	.70	NR	<1.0	67	NR	NR
FLS	6095	830127	7.1	NR	1.4	1.60	NR	<1.0	52	NR	NR
FLS	6103	830302	16.7	NR	4.1	1.80	NR	NR	66	NR	NR
FLS	6109	830413	15.9	NR	<1.0	1.70	NR	<1.0	54	NR	NR
FLS	6115	830504	11.8	NR	1.2	.30	NR	<1.0	53	NR	NR
FLS	6118	830531	102.0	5.1	2.3	58.00	168.6	2.7	130	NR	NR
FLS	6130	830606	16.5	NR	NR	NR	23.6	NR	NR	NR	NR
FMP	0004	840131	15.8	9.2	5.9	5.30	NR	NR	111	NR	100
FMP	0014	840305	6.7	3.5	1.5	.90	NR	<.5	54	NR	63
FMP	0024	840402	7.2	6.7	2.8	2.50	NR	.7	47	NR	93
FMP	0042	840429	10.0	3.1	2.8	2.10	2.9	.6	133	NR	87
FMP	0052	840514	8.2	<1.0	<1.0	2.30	1.4	.9	93	NR	95
FMP	0062	840520	16.7	2.7	1.4	7.80	17.7	.5	127	NR	92
FMP	0072	840625	12.9	4.0	<1.0	NR	NR	NR	65	NR	NR
FMP	0081	840725	7.4	1.3	<1.0	1.00	NR	<.8	31	NR	NR
FMP	0089	840806	7.3	<1.0	<1.0	1.70	NR	<.8	27	NR	72
FMP	0099	840904	4.3	1.4	<1.0	.60	NR	2.4	32	NR	78
FMP	0110	841003	4.2	2.5	<1.0	.50	NR	<.8	42	NR	67
FMP	0120	841112	8.9	5.0	3.2	.80	NR	<.8	63	NR	64
FMP	0131	841209	7.3	5.0	2.6	.60	NR	<.8	68	NR	66
FMP	0142	850106	5.5	4.1	1.9	.70	NR	<1.0	70	NR	70
FMP	0154	850210	7.8	3.4	1.3	1.20	NR	<1.0	61	NR	68
FMP	0165	850304	8.9	5.0	2.9	1.50	NR	<1.0	54	NR	96
FMP	0192	850401	14.2	6.4	4.0	2.20	2.3	.8	86	NR	100
FMP	0196	850424	20.7	4.7	1.9	7.10	13.7	<.5	115	NR	115
FMP	0209	850512	19.6	6.5	2.0	9.00	17.7	<.5	127	NR	83
FMP	0231	850528	48.9	5.1	3.2	32.00	65.4	1.1	124	NR	147
FMP	0235	850611	33.2	6.1	2.1	7.80	36.6	<.5	90	NR	112
FMP	0252	850630	7.4	2.7	<1.0	2.30	2.9	.6	52	NR	87
FMP	0263	850729	6.4	1.6	<1.0	1.20	NR	<.2	66	NR	52
FMP	0274	850826	5.8	2.8	1.0	.60	NR	<.2	64	NR	54
FMP	0285	850909	5.4	2.3	1.0	.80	1.8	.4	65	NR	50
FMP	0301	851006	4.8	2.1	<1.0	.80	NR	<.2	66	NR	57
FMP	0315	851111	5.9	4.2	2.0	1.60	NR	.7	78	NR	73
FMP	0327	851209	12.1	8.0	4.9	1.30	NR	.9	97	NR	236
FMP	0338	860106	5.7	2.9	1.6	1.30	NR	.5	79	NR	58
FMP	0351	860203	13.7	10.8	5.5	2.20	NR	.6	76	NR	83
FMP	0367	860303	21.7	10.7	7.6	6.70	NR	5.4	132	NR	147
FMP	0380	860331	16.9	5.4	2.1	8.40	11.9	1.1	84	14	148
FMP	0392	860414	11.0	3.9	1.4	3.60	5.3	.5	71	6	114
FMP	0404	860428	11.2	3.2	<1.0	4.60	7.2	.3	69	<5	97
FMP	0418	860512	11.0	4.3	1.0	4.90	7.8	.5	52	7	98
FMP	0430	860603	64.5	4.2	1.9	45.00	115.3	.4	63	6	193
FMP	0448	860616	11.2	2.5	<1.0	4.30	9.3	.6	56	<5	62
FMP	0459	860630	7.9	2.8	1.0	1.20	2.6	.7	35	7	44
FMP	0470	860728	7.5	1.7	<1.0	1.70	NR	.5	12	<5	82
FMP	0487	860902	7.2	3.7	<1.0	1.20	NR	.8	10	6	87

Table A.I.12. Flathead River at Holt. Flathead Basin Commission site # FBC05012. Concentrations (ug/l) of selected organics and physical variables.

Sample #	Date Coll	pH	Cond.	Alk.	NDOC	DOC	DIC	SiO_2
FMP 0004	840131	8.09	162	86	.15	.97	NR	5.5
FMP 0014	840305	8.01	NR	84	.14	.99	NR	4.2
FMP 0024	840402	7.98	177	107	.19	1.66	NR	5.1
FMP 0042	840429	8.04	158	96	.22	1.46	NR	5.8
FMP 0052	840514	8.08	158	94	.17	1.40	NR	4.7
FMP 0062	840520	7.96	145	84	.33	1.71	16.11	5.3
FMP 0072	840625	NR	NR	NR	NR	NR	NR	4.4
FMP 0081	840725	NR	149	94	NR	NR	NR	4.7
FMP 0089	840806	8.23	164	97	.29	1.83	20.28	5.1
FMP 0099	840904	8.10	153	90	.14	1.30	20.90	4.3
FMP 0110	841003	8.17	148	91	.12	.83	22.20	4.6
FMP 0120	841112	8.17	176	99	.13	.76	23.28	5.3
FMP 0131	841209	8.10	172	97	.12	1.18	20.93	4.9
FMP 0142	850106	8.08	160	88	.11	1.13	19.73	4.6
FMP 0154	850210	8.12	149	82	.11	.97	19.37	3.5
FMP 0165	850304	8.18	164	90	.14	1.50	20.70	4.4
FMP 0192	850401	8.14	187	98	.19	1.52	LE	4.8
FMP 0196	850424	8.11	172	90	.21	1.88	LE	6.4
FMP 0209	850512	7.93	NR	80	.22	1.57	LE	6.1
FMP 0231	850528	8	132	78	.32	1.58	18.80	4.3
FMP 0235	850611	8.17	123	71	.32	1.44	17.46	5.6
FMP 0252	850630	8.16	133	74	.17	2.07	20	4.6
FMP 0263	850729	7.96	163	84	.12	1.08	18.40	4.7
FMP 0274	850826	8.05	157	88	.14	1.24	20.80	4.3
FMP 0285	850909	8.10	162	85			19.88	3.6
FMP 0301	851006	8.13	169	87			20.29	2.9
FMP 0315	851111	8.16	151	86				5.1
FMP 0327	851209	8.04	173	99				5.2
FMP 0338	860106	8.12	152	87				4.5
FMP 0351	860203	8.15	179	100				5.4
FMP 0367	860303	8.09	186	98				6.4
FMP 0380	860331	8.10	177	97				6.4
FMP 0392	860414	8.12	175	94				5.5
FMP 0404	860428	8.08	164	90				6.0
FMP 0418	860512	8.18	167	90				5.9
FMP 0430	860603	8.08	141	71				5.1
FMP 0448	860616	8.10	152	83				4.9
FMP 0459	860630	8.12	159	88				4.6
FMP 0470	860728	8.31	180	95				5.7
FMP 0487	860902	8.18	173	98				5.9

Table A.I.13. Flathead River at Holt. Flathead Basin Commission site # FBC05012. Concentrations (ug/l) of selected metals.

Sample #	Date Coll	Ca	Mg	Fe
FMP 0004	840131	27.60	7.52	<.10
FMP 0014	840305	25.10	6.47	<.10
FMP 0024	840402	27.99	7.05	<.10
FMP 0042	840429	26.71	6.89	<.10
FMP 0052	840514	27.79	7.56	.31
FMP 0062	840520	26.51	6.54	.10
FMP 0072	840625	NR	NR	NR
FMP 0081	840725	NR	NR	NR
FMP 0089	840806	25.10	6.21	<.10
FMP 0099	840904	26.02	6.34	<.10
FMP 0110	841003	24.90	6.69	<.10
FMP 0120	841112	27.50	7.32	<.10
FMP 0131	841209	27.83	6.44	<.10
FMP 0142	850106	27.20	5.98	<.10
FMP 0154	850210	26.26	5.66	<.10
FMP 0165	850304	26.12	6.16	<.10
FMP 0192	850401	26.87	6.38	.12
FMP 0196	850424	28.20	6.86	<.10
FMP 0209	850512	25.84	5.54	<.10
FMP 0231	850528	22.17	4.98	<.10
FMP 0235	850611	22.17	5.09	<.10
FMP 0252	850630	24.87	5.97	<.10
FMP 0263	850729	23.86	4.87	<.10
FMP 0274	850826	24.59	6.20	<.10
FMP 0285	850909	25.04	6.82	<.10
FMP 0301	851006	28.16	6.83	<.10
FMP 0315	851111	28.16	6.91	<.10
FMP 0327	851209	33.68	7.79	<.10
FMP 0338	860106	26.97	6.20	<.10
FMP 0351	860203	30.17	6.92	.19
FMP 0367	860303	32.33	7.97	<.10
FMP 0380	860331	30.54	7.66	<.10
FMP 0392	860414	31.44	7.39	<.10
FMP 0404	860428	26.83	6.35	<.10
FMP 0418	860512	28.23	6.48	<.10
FMP 0430	860603	24.04	4.55	<.10
FMP 0448	860616	17.09	4	<.10
FMP 0459	860630	25.69	6.17	<.10
FMP 0470	860728			
FMP 0487	860902			

Table. A.I.14. Swan River at Bigfork. Flathead Basin Commission site # FBC06009. Concentrations (ug/l) of selected nutrients and physical variables.

Sample #	Date Coll	TP	SP	SRP	Turb.	TSS	NO_2	NO_3	NH_3	TKN
FLS 3844	771117	NR	NR	NR	NR	1.00	NR	90	NR	122
FLS 4130	771220	5.3	NR	NR	NR	.90	NR	NR	NR	154
FLS 4292	780125	NR	NR	NR	NR	.70	NR	76	NR	69
FLS XXX2	780215	NR	NR	NR	NR	1.10	NR	NR	NR	NR
FLS 4739	780301	2.0	NR	NR	NR	.80	NR	60	NR	40
FLS 4740	780315	5.0	NR	NR	NR	.80	NR	90	NR	30
FLS 4974	780418	5.0	NR	NR	NR	1.80	NR	70	NR	20
FLS 4997	780524	10.0	NR	NR	NR	2.00	NR	30	NR	<20
FLS 5200	780630	10.0	NR	NR	NR	3.10	NR	30	NR	40
FLS 5177	780615	9.0	NR	NR	NR	2.40	NR	10	NR	40
FLS 5284	780715	15.0	NR	NR	NR	1.30	NR	10	NR	70
FLS 5313	780730	8.0	NR	NR	NR	.70	NR	20	NR	60
FLS 5336	780815	9.0	NR	NR	NR	.50	NR	20	NR	80
FLS 5372	780830	8.0	NR	NR	NR	.90	NR	20	NR	60
FLS 5388	780930	9.0	NR	NR	NR	.90	NR	20	NR	60
FLS 5422	781030	10.0	NR	NR	NR	.70	NR	20	NR	40
FLS 5456	781130	7.0	NR	NR	NR	.70	NR	<20	NR	NR
FLS 5490	781218	11.0	NR	NR	NR	1.20	NR	80	NR	100
FLS 5537	790228	10.0	NR	NR	NR	.50	NR	60	NR	60
FLS 5540	790331	10.0	NR	NR	NR	1.20	NR	80	NR	85
FLS 5574	790508	7.4	NR	NR	NR	3.60	NR	<20	NR	NR
FLS 5608	790602	NR	NR	NR	NR	2.50	NR	NR	NR	NR
FLS 5655	790628	10.5	NR	NR	NR	1.60	NR	24	NR	NR
FLS 5689	790712	4.3	NR	NR	NR	1.20	NR	16	NR	NR
FLS 5723	790830	5.9	NR	NR	NR	.90	NR	10	NR	NR
FLS 5760	791129	11.2	NR	NR	NR	2.10	NR	NR	NR	NR
FLS 5763	790928	4.6	NR	NR	NR	1.10	NR	<10	NR	NR
FLS 5735	791029	NR	NR	NR	NR	NR	NR	NR	NR	NR
FLS 5766	791129	5.9	NR	NR	NR	1.00	NR	60	NR	NR
FLS 5769	800105	3.2	NR	NR	NR	.70	NR	<10	NR	NR
FLS 5772	800125	NR	NR	NR	NR	3.50	NR	11	NR	NR
FLS 5775	800307	3.9	NR	NR	NR	.80	NR	<10	NR	NR
FLS 5778	800331	NR	NR	NR	NR	1.00	NR	22	NR	NR
FLS 5781	800429	34.8	NR	NR	NR	2.80	NR	37	NR	NR
FLS 5800	800512	4.9	NR	NR	NR	3.10	NR	43	NR	NR
FLS 5828	800527	22.0	NR	NR	NR	3.60	NR	48	NR	NR
FLS 5841	800625	5.0	NR	NR	NR	1.50	NR	<20	NR	NR
FRS 3135	810409	7.3	NR	<1.0	NR	NR	NR	NR	NR	102
FLS 5972	810508	7.9	NR	4.2	NR	.90	NR	30	NR	106
FLS 5981	810525	9.1	NR	<1.0	NR	2.80	NR	20	NR	116
FLS 6017	811006	4.2	NR	<1.0	NR	<.5	NR	<20	NR	70
FLS 6003	810616	6.6	NR	<1.0	NR	2.10	NR	20	NR	121
FLS 6006	810728	7.0	NR	NR	NR	1.30	NR	<20	NR	94
FLS 6018	811111	4.3	NR	<1.0	NR	<.5	NR	<20	NR	50
FLS 6026	811209	4.3	NR	<1.0	NR	.80	NR	<20	NR	169
FLS 6028	820126	4.2	NR	<1.0	NR	.70	NR	20	NR	NR
FLS 6036	820208	3.4	NR	<1.0	NR	1.00	NR	30	NR	42
FLS 6037	820318	6.4	NR	<1.0	NR	1.10	NR	38	NR	NR
FLS 6046	820420	6.2	NR	<1.0	.30	.60	NR	37	NR	NR

Table A.I.14 (continued)

Sample #	Date Coll	TP	SP	SRP	Turb.	TSS	NO_2	NO_3	NH_3	TKN
FLS 6050	820504	5.5	NR	<1.0	.60	1.60	NR	30	NR	NR
FLS 6057	820525	7.7	NR	1.0	.60	2.80	NR	22	NR	NR
FLS 6062	820610	6.4	NR	<1.0	.75	2.10	NR	26	NR	NR
FLS 6066	820713	6.7	NR	<1.0	NR	1.60	NR	<20	NR	NR
FLS 6072	820809	5.8	NR	<1.0	.40	NR	NR	<20	NR	NR
FLS 6077	820907	8.7	NR	<1.0	.40	NR	NR	<20	NR	NR
FLS 6082	821101	4.2	NR	<1.0	.30	NR	<1.0	<20	NR	NR
FLS 6088	821206	7.7	NR	<1.0	.50	NR	<1.0	<20	NR	NR
FLS 6096	830127	9.5	NR	<1.0	.70	NR	<1.0	<20	NR	NR
FLS 6101	830302	10.4	NR	<1.0	.50	NR	NR	25	NR	NR
FLS 6107	830413	8.2	NR	<1.0	.50	NR	<1.0	<20	NR	NR
FLS 6113	830504	9.6	NR	<1.0	.60	NR	<1.0	<20	NR	NR
FLS 6119	830531	11.5	NR	<1.0	2.0	3.70	.6	23	NR	NR
FMP 0005	840131	4.9	3.7	<1.0	.60	NR	LE	LE	NR	78
FMP 0015	840305	4.9	5.5	<1.0	.60	NR	<.5	31	NR	75
FMP 0025	840402	3.4	6.1	<1.0	.40	NR	<.5	28	NR	62
FMP 0043	840429	6.4	2.2	<1.0	.50	.70	<.5	33	NR	98
FMP 0053	840514	5.0	<1.0	1.1	.40	3.00	.6	40	NR	99
FMP 0063	840520	5.6	2.3	<1.0	.70	1.30	.5	36	NR	94
FMP 0073	840625	5.3	1.3	<1.0	NR	NR	NR	39	NR	NR
FMP 0080	840725	6.0	<1.0	<1.0	.40	NR	<.8	<20	NR	NR
FMP 0090	840806	3.8	<1.0	<1.0	.40	NR	<.8	<20	NR	85
FMP 0100	840904	5.3	2.1	<1.0	.40	NR	<.8	<20	NR	89
FMP 0111	841003	4.8	3.0	<1.0	.50	NR	<.8	<20	NR	64
FMP 0121	841112	5.8	3.1	<1.0	.30	NR	<.8	23	NR	66
FMP 0132	841209	5.0	3.8	<1.0	.20	NR	<.8	22	NR	63
FMP 0143	850106	3.0	2.8	<1.0	.20	NR	<1.0	33	NR	60
FMP 0155	850210	5.5	2.3	<1.0	.40	NR	<1.0	45	NR	60
FMP 0166	850304	4.1	2.8	<1.0	.50	NR	<1.0	42	NR	37
FMP 0193	850401	6.4	2.7	<1.0	1.9	<.5	.5	69	NR	60
FMP 0198	850424	9.4	3.0	<1.0	.60	.90	<.5	45	NR	70
FMP 0208	850512	7.4	5.0	<1.0	.60	1.20	<.5	54	NR	69
FMP 0225	850527	10.7	3.5	<1.0	1.8	4.20	.6	66	NR	127
FMP 0236	850611	11.7	6.2	<1.0	.70	3.50	.6	53	NR	83
FMP 0253	850630	6.3	5.1	<1.0	.90	1.30	.6	<10	NR	167
FMP 0264	850729	9.8	2.1	<1.0	.70	NR	<.2	<10	NR	95
FMP 0275	850826	17.6	3.1	<1.0	.50	NR	<.2	<10	NR	141
FMP 0286	850909	4.8	3.2	<1.0	.40	.80	<.2	<10	NR	70
FMP 0303	851006	8.4	1.7	<1.0	2.0	NR	.2	<10	NR	132
FMP 0316	851111	4.7	3.6	<1.0	.40	NR	.3	26	NR	82
FMP 0328	851209	4.9	2.5	<1.0	.40	NR	.2	38	NR	100
FMP 0339	860106	4.5	2.5	<1.0	.30	NR	.4	43	NR	49
FMP 0352	860203	4.3	3.7	<1.0	.40	NR	.2	61	NR	58
FMP 0368	860303	7.7	4.3	1.1	1.1	NR	.4	66	NR	71
FMP 0381	860401	6.5	4.2	<1.0	1.2	1.60	.3	60	<5	86
FMP 0393	860414	6.5	3.4	<1.0	1.2	1.00	.4	38	<5	92
FMP 0405	860428	5.3	2.8	<1.0	.54	.50	.4	28	<5	106
FMP 0419	860512	5.9	3.1	<1.0	1.1	1.20	.3	24	<5	96
FMP 0431	860603	12.8	3.8	<1.0	4.8	6.80	.4	21	<5	156
FMP 0449	860616	7.1	3.0	<1.0	1.9	2.60	.4	<10	<5	109
FMP 0460	860630	5.4	3.2	1.0	.42	1.30	<.2	<10	5	104
FMP 0471	860728	5.8	1.7	<1.0	.51	NR	<.2	<10	<5	83
FMP 0488	860902	5.1	4.1	<1.0	.51	NR	<.2	16	6	74

Table A.I.15. Swan River at Bigfork. Flathead Basin Commission site # FBC06009. Concentrations (ug/l) of organics and selected physical variables.

Sample #	Date Coll	pH	Cond.	Alk.	NDOC	DOC	DIC	SiO_2
FMP 0005	840131	8.15	167	94	.17	1.03	NR	7.6
FMP 0015	840305	8.12	NR	106	.13	1.35	NR	7.0
FMP 0025	840402	8.01	180	104	.18	1.44	NR	6.9
FMP 0043	840429	8.08	167	107	.21	1.22	NR	5.7
FMP 0053	840514	8.15	166	105	.26	1.58	NR	6.4
FMP 0063	840520	8.07	168	100	.24	1.55	21.23	6.9
FMP 0073	840625	NR	NR	NR	NR	NR	NR	5.7
FMP 0080	840725	NR	137	88	NR	NR	NR	5.8
FMP 0090	840806	8.28	150	90	.27	2.12	20.65	6.5
FMP 0100	840904	8.17	148	86	.23	1.34	20.20	6.1
FMP 0111	841003	8.22	148	91	.18	.95	21.80	6.5
FMP 0121	841112	8.16	164	97	.11	.96	22.53	7.0
FMP 0132	841209	8.10	172	98	.10	.95	21.69	6.6
FMP 0143	850106	8.12	173	95	.14	1.45	20.34	7.3
FMP 0155	850210	8.18	174	101	.10	.89	23.22	6.2
FMP 0166	850304	8.21	189	106	.10	3.58	24.30	7.2
FMP 0193	850401	8.21	187	104	LE	LE	LE	7.3
FMP 0198	850424	8.19	175	102	.13	1.23	LE	7.3
FMP 0208	850512	8.05	140	94	.16	1.61	LE	7.6
FMP 0225	850527	8.03	141	85	.19	1.73	24.10	6.2
FMP 0236	850611	8.16	130	77	.31	1.78	19.79	5.7
FMP 0253	850630	8.27	128	81	.27	1.81	18.60	5.5
FMP 0264	850729	8.10	160	86	.22	1.26	18.70	7.1
FMP 0275	850826	8.27	154	93	.20	1.97	21.60	6.5
FMP 0286	850909	8.23	147	80			21.22	5.4
FMP 0303	851006	8.23	165	88			20.60	2.5
FMP 0316	851111	8.15	159	94				6.4
FMP 0328	851209	8.10	168	98				6.8
FMP 0339	860106	8.26	180	106				7.0
FMP 0352	860203	8.22	180	101				7.4
FMP 0368	860303	8.14	184	104				8.7
FMP 0381	860401	8.10	176	99				7.5
FMP 0393	860414	8.10	176	99				7.3
FMP 0405	860428	8.13	169	97				7.3
FMP 0419	860512	8.18	170	97				7.6
FMP 0431	860603	8.02	151	82				6.8
FMP 0449	860616	8.12	138	76				5.7
FMP 0460	860630	8.14	141	80				6.0
FMP 0471	860728	8.28	162	87				7.6
FMP 0488	860902	8.19	162	95				7.3

Table A.I.16. Swan River at Bigfork. Flathead Basin Commission site # FBC06009. Concentrations (ug/l) of selected metals.

Sample #	Date Coll	Ca	Mg	Fe
FMP 0005	840131	28.84	7.74	<.10
FMP 0015	840305	26.04	7.97	<.10
FMP 0025	840402	30.01	7.28	<.10
FMP 0043	840429	28.91	7.12	<.10
FMP 0053	840514	28.94	7.56	<.10
FMP 0063	840520	29.39	7.31	<.10
FMP 0073	840625	NR	NR	NR
FMP 0080	840725	NR	NR	NR
FMP 0090	840806	25.41	5.53	<.10
FMP 0100	840904	24.80	5.89	<.10
FMP 0111	841003	25.48	6.59	<.10
FMP 0121	841112	25.48	6.50	<.10
FMP 0132	841209	28.14	6.35	<.10
FMP 0143	850106	29.71	6.17	<.10
FMP 0155	850210	30.02	6.44	<.10
FMP 0166	850304	30.10	7.01	<.10
FMP 0193	850401	29.67	7.03	<.10
FMP 0198	850424	30.92	6.74	<.10
FMP 0208	850512	29.90	6.08	<.10
FMP 0225	850527	24.42	5.80	<.10
FMP 0236	850611	23.07	5.36	<.10
FMP 0253	850630	23.97	5.32	<.10
FMP 0264	850729	23.86	5.76	<.10
FMP 0275	850826	25.50	6.35	<.10
FMP 0286	850909	25.04	6.67	<.10
FMP 0303	851006	26.32	6.95	<.10
FMP 0316	851111	30.00	6.99	<.10
FMP 0328	851209	32.76	7.19	<.10
FMP 0339	860106	33.86	7.45	<.10
FMP 0352	860203	30.17	6.65	<.10
FMP 0368	860303	32.33	7.43	<.10
FMP 0381	860401	30.54	7.07	<.10
FMP 0393	860414	30.99	7.07	<.10
FMP 0405	860428	28.69	6.57	<.10
FMP 0419	860512	30.09	6.40	<.10
FMP 0431	860603	24.50	4.94	<.10
FMP 0449	860616	17.50	3.75	<.10
FMP 0460	860630	23.23	5.12	<.10
FMP 0471	860728			
FMP 0488	860902			

Table A.I.17. Stoner Creek. Flathead Basin Commission site # FBC05018. Concentration of nutrients and selected physical variables.

Sample #	Date Coll	TP	SP	SRP	Turb.	TSS	NO_2	NO_3	NH_3	TKN
FMP 0304	851006	17.1	13.4	5.7	1.1	NR	<.2	<10	NR	183
FMP 0317	851111	20.2	16.1	7.8	1.6	NR	.4	22	NR	174
FMP 0330	851209	31.8	23.2	11.2	1.8	NR	.3	68	NR	299
FMP 0341	860106	21.8	15.9	10.3	2.6	NR	.8	142	NR	128
FMP 0354	860203	33.1	21.7	11.6	4.6	NR	1.0	64	NR	178
FMP 0370	860203	49.5	24.3	15.8	6.8	NR	1.6	74	NR	264
FMP 0383	860331	41.8	22.6	12.8	9.6	37.8	.5	50	6	341
FMP 0395	860414	23.4	13.4	6.7	3.7	7.6	.2	18	<5	162
FMP 0407	860428	19.0	12.8	6.0	2.6	5.8	<.2	12	<5	163
FMP 0421	860512	22.1	13.7	6.8	3.8	10.5	<.2	66	<5	150
FMP 0433	860603	33.7	17.7	10.1	4.5	18.3	.2	13	<5	246
FMP 0451	860616	24.9	17.0	9.6	2.5	8.0	<.2	22	5	192
FMP 0462	860630	26.0	18.9	11.7	1.6	6.6	.2	15	7	200
FMP 0473	860728	22.1	14.9	9.7	.91	NR	<.2	<10	7	145
FMP 0490	860902	23.4	23.5	12.6	1.4	NR	.3	<10	5	160

Table A.I.18. Stoner Creek. Flathead Basin Commission site # FBC05018. Concentration of organics and selected physical variables.

Sample #	Date Coll	pH	Cond.	Alk.	DIC	SiO_2
FMP 0304	851006	8.28	282	157	36.46	10.5
FMP 0317	851111	8.16	228	133		16.3
FMP 0330	851209	8.23	242	139		15.1
FMP 0341	860106	8.39	272	155		15.2
FMP 0354	860203	8.27	211	117		14.8
FMP 0370	860203	8.10	178	97		15.6
FMP 0383	860331	8.15	204	114		15.3
FMP 0395	860414	8.11	179	99		14
FMP 0407	860428	8.14	185	102		13.6
FMP 0421	860512	8.19	170	92		14.4
FMP 0433	860603	8.28	201	109		14.2
FMP 0451	860616	8.33	258	147		14.1
FMP 0462	860630	8.31	270	159		14.1
FMP 0473	860728	8.43	313	177		14.8
FMP 0490	860902	8.36	282	172		13.8

Table A.I.19. Stoner Creek. Flathead Basin Commission site # FBC05018. Concentration (ug/1) of selected metals.

Sample #	Date Coll	Ca	Mg	Fe
FMP 0304	851006	46.58	13.48	.13
FMP 0317	851111	39.21	11.50	<.10
FMP 0330	851209	41.05	12	<.10
FMP 0341	860106	45.68	12.67	<.10
FMP 0354	860203	33.88	8.96	.24
FMP 0370	860203	27.86	8.34	.10
FMP 0383	860331	34.12	8.92	.10
FMP 0395	860414	30.54	7.75	.10
FMP 0407	860428	29.16	7.64	<.10
FMP 0421	860512	25.90	6.57	<.10
FMP 0433	860603	30.56	7.60	<.10
FMP 0451	860616	32.24	8.91	<.10
FMP 0462	860630	42.48	11.66	<.10
FMP 0473	860728			
FMP 0490	860902			

Table A.I.20. Flathead Lake - Midlake deep, 1977. Flathead Basin Commission site # FBC05014. Concentration (ug/l) of selected nutrient variables.

Sample #	Date Coll	Depth	TP	TSS	NO_3	TKN
FLS 3833	771117	80	NR	1.8	81	76
FLS 3834	771117	60	NR	1.6	89	109
FLS 3835	771117	95	NR	NR	131	83
FLS 3836	771117	50	NR	1.6	95	102
FLS 3837	771117	30	NR	.8	105	102
FLS 3838	771117	10	NR	.6	48	69
FLS 3839	771117	90	NR	1.3	136	76
FLS 3840	771117	20	NR	.8	104	56
FLS 3841	771117	1	NR	.8	89	115
FLS 3842	771117	40	NR	.8	122	109
FLS 3843	771117	70	NR	.8	84	135
FLS 4117	771220	1	4.0	.7	NR	154
FLS 4118	771220	10	4.0	1.0	NR	278
FLS 4119	771220	20	4.8	.8	NR	213
FLS 4120	771220	30	4.4	.8	NR	181
FLS 4121	771220	40	4.1	1.0	NR	194
FLS 4122	771220	50	3.9	.8	NR	200
FLS 4123	771220	60	5.1	.9	NR	311
FLS 4124	771220	70	5.4	.8	NR	102
FLS 4125	771220	80	5.7	1.2	NR	233
FLS 4126	771220	90	4.3	.6	NR	233
FLS 4127	771220	95	4.2	NR	NR	102

Table A.I.21. Flathead Lake - Midlake deep, 1978. Flathead Basin Commission site # FBC05014. Concentration (ug/l) of selected nutrients and physical variables.

Sample #	Date Coll	Depth	TP	TSS	NO_3-N	TKN
FLS 4280	780125	1	5.0	.6	124	76
FLS 4281	780125	10	4.3	.7	123	37
FLS 4282	780125	20	5.1	.7	64	69
FLS 4283	780125	30	4.6	.8	109	69
FLS 4284	780125	40	5.7	.7	77	69
FLS 4285	780125	50	4.9	.6	115	69
FLS 4286	780125	60	6.0	.8	121	89
FLS 4287	780125	70	6.5	.9	104	76
FLS 4288	780125	80	4.3	.9	115	69
FLS 4289	780125	90	8.2	.9	117	69
FLS 4286	780125	MD	NR	NR	NR	NR
FLS XX10	780215	70	NR	.4	NR	NR
FLS XX11	780215	80	NR	.4	NR	NR
FLS XX12	780215	90	NR	.3	NR	NR
FLS XX13	780215	20	NR	.6	NR	NR
FLS XX15	780215	10	NR	.3	NR	NR
FLS XXX4	780215	1	NR	.4	NR	NR
FLS XXX6	780215	30	NR	.4	NR	NR
FLS XXX7	780215	40	NR	.5	NR	NR
FLS XXX8	780215	50	NR	.5	NR	NR
FLS XXX9	780215	60	NR	.2	NR	NR
FLS 4713	780301	1	3.0	.7	30	<20
FLS 4714	780301	10	5.0	1.1	40	<20
FLS 4715	780301	20	3.0	.9	40	<20
FLS 4716	780301	30	7.0	.6	40	40
FLS 4717	780301	40	7.0	.6	40	40
FLS 4718	780301	50	7.0	.4	50	40
FLS 4719	780301	60	5.0	.4	50	30
FLS 4720	780301	70	5.0	<.2	50	30
FLS 4721	780301	80	5.0	.4	40	30
FLS 4722	780301	90	5.0	NR	40	30
FLS 4723	780315	1	5.0	.7	40	30
FLS 4724	780315	10	5.0	.6	50	30
FLS 4725	780315	20	7.0	.5	40	40
FLS 4726	780315	30	7.0	.5	50	40
FLS 4727	780315	40	5.0	.6	40	30
FLS 4728	780315	50	5.0	.6	50	30
FLS 4729	780315	60	5.0	.6	40	30
FLS 4730	780315	70	7.0	.6	40	30
FLS 4731	780315	80	7.0	.5	50	30
FLS 4732	780315	90	7.0	.6	60	30
FLS 4969	780418	90	10.0	.9	40	30
FLS 4973	780418	80	11.0	1.0	40	30
FLS 4975	780418	40	10.0	1.4	40	20
FLS 4976	780418	60	7.0	1.2	40	20
FLS 4977	780418	1	7.0	1.9	30	20
FLS 4978	780418	20	6.0	1.9	20	30
FLS 4979	780418	50	12.0	1.2	20	30
FLS 4980	780418	70	12.0	1.3	30	30
FLS 4987	780418	10	10.0	1.9	30	20
FLS 4988	780418	30	10.0	1.8	40	20
FLS 4990	780524	20	5.0	1.2	20	20
FLS 4991	780524	40	8.0	.9	10	30
FLS 4993	780524	70	7.0	.9	20	20
FLS 4995	780524	30	7.0	1.2	20	30
FLS 4996	780524	50	9.0	.8	10	40
FLS 4998	780524	10	8.0	.8	30	20
FLS 4999	780524	90	9.0	1.4	20	20
FLS 5000	780524	60	8.0	.8	30	20
FLS 5001	780524	80	6.0	1.5	20	20
FLS 5002	780524	1	8.0	.9	10	20
FLS 5187	780615	1	8.0	1.4	10	50
FLS 5188	780615	10	11.0	1.8	70	90
FLS 5189	780615	20	8.0	1.1	30	40

Table A.I.21. (continued)

Sample #	Date Coll	Depth	TP	TSS	NO_3-N	TKN
FLS 5190	780615	30	8.0	1.0	30	40
FLS 5191	780615	40	12.0	.6	30	40
FLS 5192	780615	50	8.0	.8	10	40
FLS 5193	780615	60	8.0	1.1	20	40
FLS 5195	780615	70	10.0	.9	10	40
FLS 5196	780615	80	8.0	.9	10	40
FLS 5197	780615	90	8.0	1.4	20	40
FLS XX14	780615	15	NR	1.7	NR	NR
FLS XXX5	780615	5	NR	2.3	NR	NR
FLS 5167	780630	50	12.0	1.0	40	40
FLS 5168	780630	1	9.0	1.0	<10	40
FLS 5169	780630	20	9.0	.9	10	40
FLS 5170	780630	60	9.0	1.0	20	40
FLS 5171	780630	5	12.0	1.0	10	40
FLS 5172	780630	15	9.0	.8	20	40
FLS 5173	780630	30	14.0	.9	10	50
FLS 5174	780630	90	8.0	1.2	30	30
FLS 5175	780630	70	8.0	1.1	20	40
FLS 5176	780630	40	8.0	.8	10	40
FLS 5180	780630	80	8.5	1.1	80	75
FLS 5181	780630	10	12.0	1.2	60	75
FLS 5319	780715	1	8.0	.5	50	130
FLS 5320	780715	5	5.0	.9	20	60
FLS 5321	780715	10	7.0	1.4	20	80
FLS 5322	780715	15	11.0	1.2	20	90
FLS 5323	780715	20	15.0	1.0	40	100
FLS 5324	780715	30	8.0	.8	40	70
FLS 5325	780715	40	8.0	.8	40	60
FLS 5326	780715	50	16.0	.8	65	90
FLS 5327	780715	60	7.0	.6	20	30
FLS 5328	780715	70	6.0	.7	40	60
FLS 5329	780715	80	6.0	.6	30	50
FLS 5330	780715	90	11.0	.7	50	60
FLS 5300	780730	1	7.0	.7	20	90
FLS 5301	780730	5	8.0	.6	10	90
FLS 5302	780730	10	20.0	.2	NR	NR
FLS 5303	780730	15	16.0	.6	30	70
FLS 5304	780730	20	16.0	1.0	40	60
FLS 5305	780730	30	12.0	.7	40	40
FLS 5306	780730	40	13.0	.6	<10	40
FLS 5307	780730	50	15.0	.6	50	40
FLS 5308	780730	60	21.0	.8	40	40
FLS 5309	780730	70	16.0	.8	30	40
FLS 5310	780730	80	13.0	.7	40	40
FLS 5311	780730	90	14.0	1.4	20	40
FLS 5352	780730	25	12.0	.5	40	50
FLS 5339	780815	1	8.0	.6	<10	80
FLS 5340	780815	5	9.0	.5	30	90
FLS 5341	780815	10	12.0	.4	55	130
FLS 5342	780815	15	10.0	.9	50	70
FLS 5343	780815	20	10.0	.7	70	60
FLS 5344	780815	25	7.0	.5	40	60
FLS 5345	780815	30	8.0	.7	50	60
FLS 5346	780815	40	10.0	.5	110	100
FLS 5347	780815	50	7.0	.6	80	70
FLS 5348	780815	60	10.0	.6	60	50
FLS 5349	780815	70	12.0	.6	50	80
FLS 5350	780815	80	11.0	.8	50	60
FLS 5351	780815	90	12.0	.7	60	80
FLS 5374	780830	1	7.0	NR	40	30
FLS 5375	780830	5	4.0	.2	30	40
FLS 5376	780830	10	7.0	.2	50	30
FLS 5377	780830	15	6.0	<.2	40	40
FLS 5378	780830	20	6.0	.2	40	60
FLS 5379	780830	25	6.0	.5	50	40
FLS 5380	780830	30	4.0	.2	40	40
FLS 5381	780830	40	5.0	<.2	60	50
FLS 5382	780830	50	7.0	.2	40	50
FLS 5383	780830	60	4.0	.2	50	50
FLS 5384	780830	70	6.0	.2	50	40
FLS 5385	780830	80	7.0	<.2	60	40
FLS 5386	780830	90	4.0	.2	40	40

Table A.I.21. (continued)

Sample #	Date Coll	Depth	TP	TSS	NO_3-N	TKN
FLS 5390	780930	1	13.0	.9	40	60
FLS 5391	780930	5	8.0	.8	20	60
FLS 5392	780930	10	7.0	.8	40	40
FLS 5393	780930	15	7.0	1.2	50	40
FLS 5394	780930	20	7.0	.6	50	40
FLS 5395	780930	25	10.0	.3	60	40
FLS 5396	780930	30	9.0	.5	70	60
FLS 5397	780930	40	8.0	.2	80	50
FLS 5398	780930	50	12.0	.2	60	40
FLS 5399	780930	60	13.0	<.2	60	40
FLS 5400	780930	70	9.0	.8	90	40
FLS 5401	780930	80	10.0	2.8	130	60
FLS 5402	780930	90	17.0	5.5	70	30
FLS 5424	781030	1	7.0	.6	<20	70
FLS 5425	781030	5	7.0	.5	<20	110
FLS 5426	781030	10	10.0	.3	30	70
FLS 5427	781030	15	11.0	.3	<20	60
FLS 5428	781030	20	11.0	.3	<20	40
FLS 5429	781030	25	11.0	.3	<20	60
FLS 5430	781030	30	10.0	.2	40	70
FLS 5431	781030	40	8.0	.2	50	<40
FLS 5432	781030	50	9.0	.2	30	<40
FLS 5433	781030	60	7.0	.2	30	90
FLS 5434	781030	70	9.0	.2	40	100
FLS 5435	781030	80	8.0	.2	35	145
FLS 5436	781030	90	8.0	.5	50	40
FLS 5458	781130	1	10.0	.6	<20	<40
FLS 5459	781130	5	9.0	.6	<20	210
FLS 5460	781130	10	8.0	.6	<20	50
FLS 5461	781130	15	9.0	.5	<20	<40
FLS 5462	781130	20	8.0	.6	<20	<40
FLS 5463	781130	25	7.0	.4	30	<40
FLS 5464	781130	30	8.0	.5	30	100
FLS 5465	781130	40	8.0	.5	20	80
FLS 5466	781130	50	9.0	.4	<20	210
FLS 5467	781130	60	8.0	.7	20	120
FLS 5468	781130	70	5.0	.6	<20	<40
FLS 5469	781130	80	8.0	.6	20	70
FLS 5470	781130	90	7.0	.7	20	70
FLS 5492	781218	1	10.0	.6	30	80
FLS 5493	781218	5	13.0	.5	60	150
FLS 5494	781218	10	9.0	.4	60	70
FLS 5495	781218	15	10.0	.5	60	80
FLS 5496	781218	20	8.0	.6	40	90
FLS 5497	781218	25	8.0	.4	50	80
FLS 5498	781218	30	9.0	.7	80	140
FLS 5499	781218	40	8.0	.9	<20	100
FLS 5500	781218	50	9.0	.9	40	100
FLS 5501	781218	60	10.0	.8	60	120
FLS 5502	781218	70	15.0	.8	70	120
FLS 5503	781218	80	22.0	.7	120	160
FLS 5504	781218	90	39.0	.7	90	110

Table A.I.22. Flathead Lake - Midlake deep, 1979. Flathead Basin Commission site # FBC05014. Concentration (ug/l) of selected nutrients and physical variables.

Sample #	Date Coll	Depth	TP	TSS	NO_3	TKN
FLS 5523	790228	1	15.0	.2	45	105
FLS 5524	790228	5	8.0	.3	40	60
FLS 5525	790228	10	8.0	.2	40	70
FLS 5526	790228	15	9.0	.2	50	70
FLS 5527	790228	20	6.0	.2	50	70
FLS 5528	790228	25	11.0	.3	110	110
FLS 5529	790228	30	8.0	.3	50	60
FLS 5530	790228	40	7.0	.2	60	60
FLS 5531	790228	50	8.0	.3	40	90
FLS 5532	790228	60	10.0	.3	40	50
FLS 5533	790228	70	9.0	NR	75	90
FLS 5542	790331	1	10.0	NR	50	90
FLS 5543	790331	5	7.0	NR	40	90
FLS 5544	790331	10	8.0	NR	30	130
FLS 5545	790331	15	8.0	NR	50	130
FLS 5546	790331	20	9.0	NR	30	100
FLS 5547	790331	25	7.0	NR	40	190
FLS 5548	790331	30	9.0	NR	50	120
FLS 5549	790331	40	8.0	NR	60	120
FLS 5550	790331	50	11.0	NR	90	110
FLS 5551	790331	60	6.0	NR	50	90
FLS 5552	790331	70	6.0	NR	50	100
FLS 5553	790331	80	9.0	NR	70	120
FLS 5554	790331	90	10.0	NR	50	90
FLS 5576	790509	1	3.9	.4	25	NR
FLS 5577	790509	5	3.9	.4	32	NR
FLS 5578	790509	10	4.7	.2	32	NR
FLS 5579	790509	15	3.7	.5	32	NR
FLS 5580	790509	20	4.2	.3	34	NR
FLS 5581	790509	25	7.2	.6	32	NR
FLS 5582	790509	30	3.7	.5	41	NR
FLS 5583	790509	40	2.2	.5	NR	NR
FLS 5584	790509	50	3.4	.5	35	NR
FLS 5585	790509	60	3.6	.4	34	NR
FLS 5586	790509	70	4.5	.3	36	NR
FLS 5587	790509	80	3.7	.3	36	NR
FLS 5588	790509	90	3.7	.8	38	NR
FLS 5610	790602	1	3.5	1.4	<20	NR
FLS 5611	790602	5	4.2	.8	16	NR
FLS 5612	790602	10	4.9	1.3	25	NR
FLS 5613	790602	15	6.4	.4	36	NR
FLS 5614	790602	20	4.1	.4	20	NR
FLS 5615	790602	25	3.5	.4	23	NR
FLS 5616	790602	30	3.4	.2	25	NR
FLS 5617	790602	40	4.1	.2	36	NR
FLS 5618	790602	50	3.0	.2	27	NR
FLS 5619	790603	60	6.4	<.2	34	NR
FLS 5620	790603	70	3.8	.3	34	NR

Table A.I.22. (continued)

Sample #	Date Coll	Depth	TP	TSS	NO_3	TKN
FLS 5621	790603	80	5.8	<.2	38	NR
FLS 5622	790603	90	3.6	<.2	34	NR
FLS 5641	790609	1	6.3	1.5	32	NR
FLS 5642	790609	5	10.2	1.9	29	NR
FLS 5643	790609	10	9.4	2.0	48	NR
FLS 5644	790609	15	11.3	2.4	41	NR
FLS 5645	790609	20	9.1	1.9	41	NR
FLS 5646	790609	25	6.3	1.3	32	NR
FLS 5647	790609	30	4.7	.5	32	NR
FLS 5648	790609	40	4.4	.5	32	NR
FLS 5649	790609	50	4.3	.3	29	NR
FLS 5650	790609	60	4.3	.3	29	NR
FLS 5652	790609	80	LE	.6	33	NR
FLS 5657	790630	1	4.6	.5	NR	NR
FLS 5658	790630	5	4.8	.3	18	NR
FLS 5659	790630	10	5.6	.7	27	NR
FLS 5660	790630	15	6.2	1.0	34	NR
FLS 5661	790630	20	5.4	1.0	27	NR
FLS 5662	790630	25	5.2	.7	27	NR
FLS 5663	790630	30	4.6	.9	24	NR
FLS 5664	790630	40	4.0	.6	20	NR
FLS 5665	790629	50	3.2	.4	23	NR
FLS 5666	790629	60	3.4	.3	32	NR
FLS 5667	790629	70	4.0	.2	29	NR
FLS 5668	790629	80	2.8	.3	34	NR
FLS 5669	790629	90	3.0	.5	34	NR
FLS 5691	790712	1	4.2	NR	32	NR
FLS 5692	790712	5	6.1	NR	25	NR
FLS 5693	790712	10	3.6	NR	32	NR
FLS 5694	790712	15	3.8	NR	43	NR
FLS 5695	790712	20	4.6	NR	52	NR
FLS 5696	790712	25	4.2	NR	57	NR
FLS 5697	790712	30	5.2	NR	63	NR
FLS 5698	790712	40	3.2	NR	50	NR
FLS 5699	790712	50	3.4	NR	59	NR
FLS 5700	790712	60	2.9	NR	54	NR
FLS 5701	790712	70	3.0	NR	59	NR
FLS 5702	790712	80	8.5	<.5	120	NR
FLS 5703	790712	90	4.4	<.5	59	NR
FLS 5738	790727	1	5.4	NR	<10	NR
FLS 5739	790727	10	5.2	NR	34	NR
FLS 5740	790727	20	7.1	NR	52	NR
FLS 5741	790727	30	5.4	NR	81	NR
FLS 5742	790727	40	4.8	NR	52	NR

Table A.I.23. Flathead Lake - Midlake deep, 1980. Flathead Basin Commission site # FBC05014. Concentration (ug/l) of selected nutrients and physical variables.

Sample #	Date Coll	Depth	TP	Turb.	TSS	NO_3
FLS 5794	800508	1	3.0	NR	NR	34
FLS 5795	800508	25	4.0	NR	NR	34
FLS 5796	800508	50	6.0	NR	NR	36
FLS 5797	800508	75	6.0	NR	NR	32
FLS 5798	800508	100	3.0	NR	NR	36
FLS 5802	800516	1	2.7	NR	1.9	24
FLS 5803	800516	25	4.0	NR	.5	27
FLS 5804	800516	50	3.7	NR	<.5	29
FLS 5805	800516	75	3.0	NR	.7	29
FLS 5806	800516	100	3.4	NR	1.1	34
FLS 5812	800518	1	7.0	.22	1.3	38
FLS 5813	800518	25	5.0	.18	1.1	32
FLS 5814	800518	50	4.0	NR	NR	32
FLS 5815	800518	75	5.0	NR	NR	36
FLS 5816	800518	100	5.0	NR	NR	37
FLS 5817	800522	1	4.9	NR	5.2	32
FLS 5818	800522	25	6.9	NR	2.1	32
FLS 5819	800522	50	3.3	NR	.9	34
FLS 5820	800522	75	5.7	NR	1.2	36
FLS 5821	800522	100	5.8	NR	1.5	32
FLS 5822	800527	1	4.6	.12	1.4	38
FLS 5823	800527	25	5.9	.14	1.3	38
FLS 5824	800527	50	3.5	.11	NR	43
FLS 5825	800527	75	4.7	.10	1.6	38
FLS 5826	800527	100	13.4	.10	1.2	43
FLS 5830	800602	1	7.2	.21	1.9	35
FLS 5831	800602	25	4.2	.26	1.7	34
FLS 5832	800602	50	5.1	NR	NR	36
FLS 5833	800602	75	4.6	NR	NR	36
FLS 5834	800602	100	5.8	NR	NR	38
FLS 5835	800606	1	5.5	NR	NR	36
FLS 5836	800606	25	4.4	NR	NR	37
FLS 5837	800606	50	5.6	NR	NR	36
FLS 5838	800606	75	3.4	NR	NR	36
FLS 5839	800606	100	5.0	NR	NR	45
FLS 5843	800628	1	5.3	NR	4.0	32
FLS 5844	800628	25	5.9	NR	11.2	29
FLS 5845	800628	50	5.3	NR	1.3	25
FLS 5846	800628	75	6.1	NR	.7	27
FLS 5847	800628	100	6.5	NR	1.1	50

Table A.I.24. Flathead Lake - Midlake deep, 1981. Flathead Basin Commission site # FBC05014. Concentration (ug/l) of selected nutrients and physical variables.

Sample #	Date Coll	Depth	TP	SRP	TSS	NO_3	TKN
FLS 5968	810410	5	5.2	<1.0	NR	NR	95
FLS 5970	810508	5	5.2	<1.0	<.5	20	86
FLS 5991	810525	2	5.8	<1.0	1.0	30	122
FLS 5992	810525	40	4.2	<1.0	<.5	29	102
FLS 5998	810616	1	4.5	<1.0	2.4	22	86
FLS 5999	810616	10	4.1	<1.0	1.8	29	78
FLS 6000	810616	40	2.7	<1.0	<.5	42	82
FLS 6009	810728	10	3.8	LE	1.4	<20	107
FLS 6010	810728	50	2.9	LE	<.5	50	60
FLS 6012	811006	30	2.9	<1.0	<.5	30	70
FLS 6013	811006	10	3.7	<1.0	<.5	<20	89
FLS 6019	811111	5	5.0	<1.0	.6	<20	85
FLS 6020	811111	40	3.1	<1.0	<.5	56	43

Table A.I.25. Flathead Lake - Midlake deep, 1982. Flathead Basin Commission site # FBC05014. Concentration (ug/l) of selected nutrients and physical variables.

Sample #	Date Coll	Depth	TP	SRP	Turb.	TSS	NO_2	NO_3	TKN
FLS 6031	820126	10	11.1	<1.0	NR	.7	NR	30	80
FLS 6032	820126	40	3.4	<1.0	NR	<.5	NR	30	102
FLS 6041	820318	20	3.2	<1.0	NR	1.0	NR	37	NR
FLS 6044	820420	10	4.5	<1.0	.30	<.5	NR	34	NR
FLS 6049	820504	10	2.9	<1.0	.30	.5	NR	29	NR
FLS 6054	820525	10	5.6	<1.0	.40	.7	NR	21	NR
FLS 6055	820525	50	2.6	<1.0	.30	<.5	NR	28	NR
FLS 6059	820610	10	6.5	<1.0	.80	1.6	NR	28	NR
FLS 6060	820610	40	4.7	<1.0	.40	.7	NR	31	NR
FLS 6067	820713	5	5.6	<1.0	.70	NR	NR	<20	NR
FLS 6068	820713	11	9.2	1.3	1.2	NR	NR	31	NR
FLS 6069	820713	80	5.6	<1.0	.40	NR	NR	45	NR
FLS 6073	820809	5	6.0	<1.0	.40	NR	NR	<20	NR
FLS 6074	820809	50	5.0	<1.0	.40	NR	NR	46	NR
FLS 6078	820907	5	2.3	<1.0	.20	NR	NR	<20	NR
FLS 6079	820907	30	4.6	<1.0	.20	NR	NR	<20	NR
FLS 6083	821101	5	2.8	<1.0	.20	NR	<1.0	<5	NR
FLS 6084	821101	30	3.9	<1.0	.20	NR	<1.0	<5	75
FLS 6085	821101	70	4.7	<1.0	.20	NR	<1.0	6	120
FLS 6089	821206	5	5.9	<1.0	.20	NR	<1.0	33	NR
FLS 6090	821206	40	2.1	<1.0	.20	NR	<1.0	34	NR

Table A.I.26. Flathead Lake - Midlake deep, 1983. Flathead Basin Commission site # FBC05014. Concentration (ug/l) of selected nutrients and physical variables.

Sample #	Date Coll	Depth	TP	SP	SRP	Turb.	TSS	NO_2	NO_3
FLS 6091	830126	5	6.9	NR	<1.0	.40	NR	<1.0	22
FLS 6092	830126	20	4.8	NR	1.0	.30	NR	<1.0	23
FLS 6093	830126	70	5.5	NR	<1.0	.90	NR	<1.0	27
FLS 6097	830302	5	5.1	NR	<1.0	.30	NR	NR	43
FLS 6098	830302	20	6.0	NR	<1.0	.30	NR	NR	34
FLS 6099	830302	40	11.2	NR	<1.0	.30	NR	NR	39
FLS 6100	830302	80	18.8	NR	<1.0	.30	NR	NR	46
FLS 6104	830413	5	6.0	NR	<1.0	.30	NR	<1.0	29
FLS 6105	830413	20	6.3	NR	<1.0	.30	NR	<1.0	34
FLS 6106	830413	70	6.1	NR	<1.0	.30	NR	<1.0	34
FLS 6110	830504	5	6.7	NR	<1.0	.30	NR	<1.0	23
FLS 6111	830504	20	6.1	NR	<1.0	.40	NR	<1.0	28
FLS 6112	830504	70	5.7	NR	<1.0	.30	NR	.5	24
FLS 6120	830531	10	5.8	NR	<1.0	.50	NR	<.5	<20
FLS 6121	830531	20	6.0	NR	<1.0	.40	NR	<.5	<20
FLS 6122	830531	90	6.0	NR	<1.0	.30	NR	2.1	31
FLS 6124	830531	5	8.7	2.6	<1.0	.60	<.5	<.5	<20
FLS 6125	830605	2	NR	NR	NR	NR	2.2	NR	NR
FLS 6126	830605	6	NR	NR	NR	NR	11.9	NR	NR

Table A.I.27. Flathead Lake - Midlake deep, 1984. Flathead Basin Commission site # FBC05014. Concentration (ug/l) of selected nutrients and physical variables.

Sample #	Date Coll	Depth	TP	SP	SRP	Turb.	TSS	NO_2	NO_3	TKN
FMP 0007	840201	5	4.2	3.1	<1.0	.40	NR	LE	29	59
FMP 0008	840201	10	4.2	2.9	<1.0	.50	NR	LE	34	72
FMP 0009	840201	25	3.8	2.7	<1.0	.40	NR	LE	26	62
FMP 0010	840201	80	3.8	2.7	<1.0	.40	NR	LE	35	62
FMP 0017	840305	5	3.2	LE	<1.0	.30	NR	.9	27	74
FMP 0018	840305	10	3.9	3.7	<1.0	.40	NR	.6	29	71
FMP 0019	840305	25	5.2	2.9	<1.0	.30	NR	.6	29	66
FMP 0020	840305	80	2.6	LE	<1.0	.30	NR	.7	40	70
FMP 0027	840403	5	3.2	2.1	<1.0	.30	NR	.9	26	56
FMP 0028	840403	10	3.2	LE	<1.0	1.3	NR	.8	31	56
FMP 0029	840403	25	2.6	3.7	<1.0	.30	NR	.7	33	57
FMP 0030	840403	80	3.4	2.1	<1.0	.30	NR	.7	26	53
FMP 0045	840430	5	4.9	1.6	<1.0	.30	NR	.8	47	67
FMP 0046	840430	10	5.0	1.6	<1.0	.40	NR	.8	22	72
FMP 0047	840430	25	4.7	2.0	1.9	.40	NR	.8	24	76
FMP 0048	840430	80	4.5	1.8	<1.0	.40	NR	.6	25	81
FMP 0055	840515	5	3.3	<1.0	<1.0	.20	NR	.9	32	97
FMP 0056	840515	10	3.5	<1.0	<1.0	.20	NR	1.0	32	104
FMP 0057	840515	25	2.8	<1.0	<1.0	.20	NR	1.0	33	105
FMP 0058	840515	80	2.8	<1.0	<1.0	.20	NR	1.1	36	104
FMP 0065	840521	5	5.3	1.8	<1.0	.40	1.0	.8	<20	94
FMP 0066	840521	10	4.2	2.1	<1.0	.30	1.2	.7	<20	85
FMP 0067	840521	25	2.4	1.8	<1.0	.40	.5	.7	<20	79
FMP 0068	840521	80	2.6	1.8	<1.0	.30	.5	1.0	<20	73
FMP 0069	840524	5	4.0	3.0	NR	NR	NR	NR	NR	NR
FMP 0070	840524	10	3.2	1.0	NR	NR	NR	NR	NR	NR
FMP 0071	840524	25	3.2	1.8	NR	NR	NR	NR	NR	NR
FMP 0075	840625	5	6.6	1.3	<1.0	NR	NR	NR	<20	NR
FMP 0076	840625	10	2.2	1.1	<1.0	NR	NR	NR	<20	NR
FMP 0077	840625	25	5.7	1.1	<1.0	NR	NR	NR	20	NR
FMP 0078	840625	80	3.0	LE	1.4	NR	NR	NR	30	NR
FMP 0082	840725	5	3.0	<1.0	<1.0	NR	NR	<.8	<20	NR
FMP 0083	840725	10	5.0	<1.0	<1.0	.40	NR	<.8	<20	NR
FMP 0084	840725	25	3.5	<1.0	<1.0	.20	NR	1.1	21	NR
FMP 0085	840725	80	3.8	1.1	<1.0	.20	NR	.8	43	NR
FMP 0091	840806	5	2.8	<1.0	<1.0	.20	NR	<.8	<20	87
FMP 0092	840806	10	3.0	<1.0	<1.0	.20	NR	<.8	<20	80
FMP 0093	840806	25	3.6	<1.0	<1.0	.20	NR	1.6	25	68
FMP 0094	840806	80	3.0	<1.0	<1.0	.20	NR	<.8	33	48
FMP 0102	840905	5	3.4	1.4	<1.0	.30	NR	<.8	<20	85
FMP 0103	840905	10	3.4	1.9	<1.0	.30	NR	<.8	<20	90
FMP 0104	840905	25	3.4	1.6	<1.0	.30	NR	1.3	<20	95
FMP 0105	840905	80	2.8	1.6	<1.0	.20	NR	<.8	37	55
FMP 0113	841002	5	3.5	2.9	<1.0	.40	NR	<.8	<20	67
FMP 0114	841002	10	6.3	2.7	<1.0	.40	NR	<.8	<20	71
FMP 0115	841002	25	7.1	2.6	<1.0	.30	NR	<.8	<20	67
FMP 0116	841002	80	4.0	<1.0	<1.0	.30	NR	<.8	46	47
FMP 0123	841112	5	5.0	1.6	<1.0	.30	NR	<.8	23	66
FMP 0124	841112	10	5.0	1.8	<1.0	.30	NR	<.8	20	77
FMP 0125	841112	25	5.2	1.8	<1.0	.30	NR	<.8	25	71
FMP 0126	841112	80	4.4	2.0	<1.0	.20	NR	<.8	48	50
FMP 0134	841212	5	3.4	2.1	<1.0	.40	NR	<.8	33	66
FMP 0135	841212	10	3.6	2.3	<1.0	.30	NR	<.8	30	60
FMP 0136	841212	25	4.5	2.5	<1.0	.30	NR	<.8	32	59
FMP 0137	841212	80	4.9	4.2	<1.0	.30	NR	<.8	24	55

Table A.I.28. Flathead Lake - Midlake deep, 1984. Flathead Basin Commission site # FBC05014. Concentration (ug/l) of selected organics and physical variables.

Sample #	Date Coll	Depth	pH	Alk.	Cond.	NDOC	DOC	DIC	SiO_2
FMP 0007	840201	5	8.14	80	149	.18	1.23	NR	5.5
FMP 0008	840201	10	8.14	79	149	.19	1.31	NR	5.5
FMP 0009	840201	25	8.13	80	147	.17	1.49	NR	5.5
FMP 0010	840201	80	8.14	79	149	.14	1.17	NR	5.7
FMP 0017	840305	5	8.05	88	NR	.15	1.02	NR	5
FMP 0018	840305	10	8.04	88	NR	.19	.99	NR	5.1
FMP 0019	840305	25	8.04	88	NR	.14	.95	NR	5.1
FMP 0020	840305	80	8.03	86	NR	.10	.96	NR	5.2
FMP 0027	840403	5	7.99	88	159	.17	2.66	NR	5
FMP 0028	840403	10	7.96	88	157	.15	1.17	NR	5
FMP 0029	840403	25	7.96	87	161	.13	1.51	NR	5
FMP 0030	840403	80	7.99	90	161	.20	1.17	NR	5
FMP 0031	840417	10	NR	NR	143	NR	NR	NR	NR
FMP 0032	840417	10	NR	NR	144	NR	NR	NR	NR
FMP 0033	840417	10	NR	NR	145	NR	NR	NR	NR
FMP 0034	840417	10	NR	NR	145	NR	NR	NR	NR
FMP 0035	840417	10	NR	NR	147	NR	NR	NR	NR
FMP 0036	840417	10	NR	NR	150	NR	NR	NR	NR
FMP 0037	840417	0	NR	NR	NR	NR	NR	NR	NR
FMP 0038	840417	0	NR	NR	NR	NR	NR	NR	NR
FMP 0045	840430	5	8.03	91	148	.19	.89	NR	4.6
FMP 0046	840430	10	8	92	148	.19	.96	NR	4.6
FMP 0047	840430	25	8.02	97	148	.21	1.10	NR	4.5
FMP 0048	840430	80	8.02	98	150	.22	1.17	NR	4.5
FMP 0055	840515	5	8.08	91	151	.22	1.01	NR	4.4
FMP 0056	840515	10	8.06	93	151	.25	1.16	NR	4.4
FMP 0057	840515	25	8.05	91	152	.23	1.37	NR	4.5
FMP 0058	840515	80	8.02	91	149	.17	1.21	NR	4.5
FMP 0065	840521	5	8.03	92	153	.24	1	18.48	4.9
FMP 0066	840521	10	8.06	92	155	.22	2.04	18.44	4.6
FMP 0067	840521	25	8.06	92	153	.18	1.41	18.64	5
FMP 0068	840521	80	8.02	92	158	.16	1.56	18.60	LE
FMP 0069	840524	5	NR	NR	NR	NR	NR	NR	NR
FMP 0070	840524	10	NR	NR	NR	NR	NR	NR	NR
FMP 0071	840524	25	NR	NR	NR	NR	NR	NR	NR
FMP 0075	840625	5	NR	NR	NR	NR	NR	NR	4.3
FMP 0076	840625	10	NR	NR	NR	NR	NR	NR	4.6
FMP 0077	840625	25	NR	NR	NR	NR	NR	NR	4.6
FMP 0078	840625	80	NR	NR	NR	NR	NR	NR	4.8
FMP 0082	840725	5	NR	95	150	NR	NR	NR	4.6
FMP 0083	840725	10	NR	94	149	NR	NR	NR	4.7
FMP 0084	840725	25	NR	102	159	NR	NR	NR	5.1
FMP 0085	840725	80	NR	101	160	NR	NR	NR	5.6
FMP 0091	840806	5	8.41	149	158	.23	2.32	22.79	5.4
FMP 0092	840806	10	8.42	97	158	.29	2.44	21.14	5.7
FMP 0093	840806	25	8.12	99	168	.16	3.36	22.78	5.5
FMP 0094	840806	80	8.02	99	168	.12	2.48	21.86	6
FMP 0102	840905	5	8.33	92	149	.28	1.47	20.60	4.5
FMP 0103	840905	10	8.32	86	149	.31	1.99	19.80	4.2
FMP 0104	840905	25	7.99	86	152	.25	1.84	21.40	4.6
FMP 0105	840905	80	7.86	89	160	.11	3.16	21.70	5.2
FMP 0113	841002	5	8.23	86	142	.28	1.23	21.90	4.9
FMP 0114	841002	10	8.20	87	144	.28	1.33	22.10	5
FMP 0115	841002	25	8.20	88	144	.24	1.46	21.90	5.2
FMP 0116	841002	80	8.12	88	147	.09	.88	21.70	5.1
FMP 0123	841112	5	8.15	91	162	.12	.77	19.95	5.5
FMP 0124	841112	10	8.15	91	161	.13	1.07	19.83	5.5
FMP 0125	841112	25	8.15	92	161	.11	.90	19.97	5.8
FMP 0126	841112	80	8.07	93	164	.06	.81	20.36	6.2
FMP 0134	841212	5	8.06	90	144	.12	1.26	19.50	5.3
FMP 0135	841212	10	8.01	90	145	.13	1.05	19.83	4.6
FMP 0136	841212	25	8.07	90	142	.16	1.28	20.08	5.2
FMP 0137	841212	80	7.99	90	146	.14	1.29	19.74	5.1

Table A.I.29. Flathead Lake - Midlake deep, 1984. Flathead Basin Commission site # FBC05014. Concentration (ug/l) of selected metals.

Sample #	Date Coll	Depth	Ca	Mg	Fe
FMP 0007	840201	5	26.35	6.47	<.10
FMP 0008	840201	10	26.04	6.87	<.10
FMP 0009	840201	25	25.42	6.67	<.10
FMP 0010	840201	80	26.04	NR	<.10
FMP 0017	840305	5	23.86	6.42	<.10
FMP 0018	840305	10	24.48	6.39	<.10
FMP 0019	840305	25	20.74	6.59	<.10
FMP 0020	840305	80	23.23	6.30	<.10
FMP 0027	840403	5	25.05	6.25	<.10
FMP 0028	840403	10	25.24	6.12	<.10
FMP 0029	840403	25	25.60	6.18	<.10
FMP 0030	840403	80	24.68	5.96	<.10
FMP 0045	840430	5	25.05	6.06	<.10
FMP 0046	840430	10	25.42	6.15	<.10
FMP 0047	840430	25	25.24	6.22	<.10
FMP 0048	840430	80	25.52	6.09	<.10
FMP 0055	840515	5	26.06	6.64	<.10
FMP 0056	840515	10	25.77	6.93	<.10
FMP 0057	840515	25	25.48	6.64	<.10
FMP 0058	840515	80	25.20	6.70	<.10
FMP 0065	840521	5	30.16	6.82	<.10
FMP 0066	840521	10	NR	NR	<.10
FMP 0067	840521	25	28.82	6.65	<.10
FMP 0068	840521	80	28.10	6.62	<.10
FMP 0091	840806	5	24.80	5.94	<.10
FMP 0092	840806	10	24.80	5.89	<.10
FMP 0093	840806	25	25.41	6.25	<.10
FMP 0094	840806	80	26.64	6.39	<.10
FMP 0102	840905	5	24.80	6.03	<.10
FMP 0103	840905	10	25.41	5.89	<.10
FMP 0104	840905	25	25.72	6.12	<.10
FMP 0105	840905	80	28.47	6.43	<.10
FMP 0113	841002	5	25.48	6.59	<.10
FMP 0114	841002	10	25.48	6.55	<.10
FMP 0115	841002	25	25.19	6.64	<.10
FMP 0116	841002	80	26.06	6.84	<.10
FMP 0123	841112	5	25.48	6.69	<.10
FMP 0124	841112	10	25.19	6.59	<.10
FMP 0125	841112	25	26.06	6.88	<.10
FMP 0126	841112	80	24.90	6.45	<.10
FMP 0134	841212	5	25.63	6.03	<.10
FMP 0135	841212	10	26	5.90	<.10
FMP 0136	841212	25	25.94	5.89	<.10
FMP 0137	841212	80	28.45	6.17	<.10

Table A.I.30. Flathead Lake - Midlake deep, 1985. Flathead Basin Commission site # FBC05014. Concentration (ug/l) of selected nutrients and physical variables.

Sample #	Date Coll	Depth	TP	SP	SRP	Turb.	TSS	NO_2	NO_3	TKN
FMP 0145	850106	5	3.0	2.2	<1.0	.30	NR	<1.0	30	64
FMP 0146	850106	10	2.8	2.0	<1.0	.30	NR	<1.0	35	69
FMP 0147	850106	25	3.4	2.2	<1.0	.30	NR	<1.0	42	53
FMP 0148	850106	80	2.8	2.4	<1.0	.30	NR	<1.0	32	68
FMP 0157	850210	5	5.5	2.3	<1.0	.30	NR	<1.0	34	68
FMP 0158	850210	10	5.5	2.1	<1.0	.30	NR	<1.0	33	76
FMP 0159	850210	20	5.7	2.1	<1.0	.30	NR	<1.0	33	6
FMP 0168	850304	5	3.9	1.5	<1.0	.30	NR	<1.0	26	62
FMP 0169	850304	10	4.0	1.9	<1.0	.30	NR	<1.0	28	57
FMP 0170	850304	25	3.4	1.7	<1.0	.30	NR	<1.0	38	60
FMP 0171	850304	50	3.4	1.7	<1.0	.30	NR	<1.0	40	60
FMP 0203	850425	5	6.4	2.4	<1.0	.30	.5	<.5	34	64
FMP 0204	850425	10	6.2	1.8	<1.0	.30	NR	<.5	34	62
FMP 0205	850425	25	6.0	3.2	<1.0	.30	NR	<.5	34	59
FMP 0206	850425	80	7.5	1.6	<1.0	.50	NR	<.5	36	58
FMP 0213	850512	5	8.2	3.1	<1.0	.40	1.0	<.5	29	77
FMP 0214	850512	10	6.9	3.3	<1.0	.40	NR	<.5	22	88
FMP 0215	850512	25	7.2	3.5	<1.0	.40	NR	<.5	29	72
FMP 0216	850512	80	6.1	3.7	<1.0	.30	NR	<.5	35	61
FMP 0226	850527	5	3.9	1.3	<1.0	.30	.8	<.5	31	100
FMP 0227	850527	25	4.7	2.6	<1.0	.40	1.0	<.5	30	101
FMP 0228	850527	80	3.7	2.2	<1.0	.30	1.6	<.5	39	90
FMP 0238	850611	5	10.9	5.4	<1.0	.70	.8	.5	40	77
FMP 0239	850611	10	9.2	3.9	<1.0	.60	.6	.5	36	57
FMP 0240	850611	25	7.3	3.9	<1.0	.30	<.5	<.5	24	60
FMP 0241	850611	80	7.3	5.4	<1.0	.20	.5	2.2	42	48
FMP 0247	850619	10	6.1	3.1	<1.0	1.6	NR	NR	50	88
FMP 0255	850701	5	4.5	3.1	<1.0	.70	1.0	.8	17	121
FMP 0256	850701	10	3.7	2.3	<1.0	1.1	1.1	.8	21	123
FMP 0257	850701	25	4.9	3.1	<1.0	.70	.7	4.3	43	101
FMP 0258	850701	80	3.9	2.7	<1.0	.40	.5	1.7	49	99
FMP 0266	850729	5	6.0	1.9	<1.0	.40	NR	<.2	<10	84
FMP 0267	850729	10	4.4	1.7	<1.0	.40	NR	<.2	<10	79
FMP 0268	850729	25	6.0	2.1	<1.0	.40	NR	.6	44	66
FMP 0269	850729	80	6.9	2.7	<1.0	.40	NR	.2	58	42
FMP 0277	850826	5	3.4	2.2	<1.0	.30	NR	<.2	<10	89
FMP 0278	850826	10	4.0	1.9	<1.0	.30	NR	<.2	<10	75
FMP 0279	850826	25	4.4	2.1	<1.0	.40	NR	.2	54	134
FMP 0280	850826	80	4.1	3.1	<1.0	.40	NR	<.2	64	45
FMP 0288	850909	5	2.9	1.7	<1.0	.40	1.1	.2	<10	67
FMP 0289	850909	25	3.3	1.9	<1.0	.30	LE	.4	20	63
FMP 0290	850909	80	LE	2.3	<1.0	.40	LE	<.2	59	54
FMP 0307	851008	5	4.2	1.7	<1.0	.40	NR	.2	LE	82
FMP 0308	851008	10	4.0	1.5	<1.0	.40	NR	<.2	LE	87
FMP 0309	851008	25	4.4	1.5	<1.0	.30	NR	.2	LE	76
FMP 0310	851008	70	3.8	1.7	<1.0	.30	NR	<.2	LE	55
FMP 0318	851111	5	3.6	3.4	<1.0	.40	NR	.2	38	72
FMP 0319	851111	10	3.8	2.9	<1.0	.31	NR	.2	40	72
FMP 0320	851111	25	4.0	3.1	<1.0	.37	NR	.3	45	101
FMP 0321	851111	80	3.3	3.1	<1.0	.31	NR	.2	60	67
FMP 0331	851209	5	4.5	2.5	<1.0	.36	NR	.2	43	84
FMP 0332	851209	10	4.1	1.7	<1.0	.38	NR	<.2	44	69
FMP 0333	851209	25	4.1	2.3	<1.0	.34	NR	.2	43	64
FMP 0334	851209	80	4.9	2.3	1.0	.36	NR	.2	46	69

Table A.I.31. Flathead Lake - Midlake deep, 1985. Flathead Basin Commission site # FBC05014. Concentration (ug/l) of selected organics and physical variables.

Sample #	Date Coll	Depth	pH	Alk.	Cond.	NDOC	DOC	DIC	SiO_2
FMP 0145	850106	5	8.09	89	153	.17	1.06	18.68	5.4
FMP 0146	850106	10	8	89	156	.14	1.47	18.88	6
FMP 0147	850106	25	8.08	88	154	.12	1.35	18.82	5.5
FMP 0148	850106	80	8.07	87	153	.11	1.05	18.68	5.6
FMP 0157	850210	5	8.17	88	162	.16	1.21	12.81	3.9
FMP 0158	850210	10	8.21	88	162	.10	1.73	13.36	4
FMP 0159	850210	20	8.21	90	162	.12	.96	13.51	4.4
FMP 0168	850304	5	8.21	90	165	.19	1.86	22.10	5.1
FMP 0169	850304	10	8.21	90	165	.16	3.56	21.50	5
FMP 0170	850304	25	8.17	90	165	.12	1.20	21.80	5.1
FMP 0171	850304	50	8.20	87	165	.08	1.68	21.60	5.1
FMP 0203	850425	5	8.20	89	159	.16	1.90	LE	5.2
FMP 0204	850425	10	8.17	90	159	.13	.95	LE	5
FMP 0205	850425	25	8.20	88	159	.12	1.53	LE	5.3
FMP 0206	850425	80	8.21	90	159	.12	.96	LE	5
FMP 0213	850512	5	8.06	88	147	.17	.88	LE	5.2
FMP 0214	850512	10	8.07	89	131	.16	.93	LE	5.3
FMP 0215	850512	25	8.04	89	145	.16	.87	LE	5.4
FMP 0216	850512	80	8.05	89	135	.10	1.06	LE	5.5
FMP 0226	850527	5	8.13	90	154	.16	1.18	23.90	4.3
FMP 0227	850527	25	8.07	89	164	.16	1.22	24	4.5
FMP 0228	850527	80	8.04	90	158	.89	1.19	24.60	4.7
FMP 0238	850611	5	8.25	84	146	.19	1.32	22.10	5
FMP 0239	850611	10	8.22	86	146	.19	1.26	22.49	4.6
FMP 0240	850611	25	8.22	87	148	.16	1.07	22.54	5.3
FMP 0241	850611	80	8.22	87	157	.11	1.06	23.74	5.5
FMP 0247	850619	10	NR	NR	140	NR	NR	NR	NR
FMP 0255	850701	5	8.41	82	141	.19	2.53	18.60	3.1
FMP 0256	850701	10	8.38	83	144	.22	1.72	19.70	4.1
FMP 0257	850701	25	8.12	87	151	.12	1.11	21.20	4.5
FMP 0258	850701	80	8.02	88	160	.10	1.17	21.90	4.7
FMP 0266	850729	5	8.07	83	156	.21	1.28	17	5
FMP 0267	850729	10	8.24	88	160	.20	1.19	17.30	4.2
FMP 0268	850729	25	8.03	88	169	.16	1.23	17.20	4.8
FMP 0269	850729	80	7.99	88	169	.07	1.07	18	5.3
FMP 0277	850826	5	8.27	89	145	.24	2.22	20	3.7
FMP 0278	850826	10	8.31	89	158	.26	1.83	19.80	4.3
FMP 0279	850826	25	8.15	91	159	.16	1.41	19.80	4.7
FMP 0280	850826	80	8.11	92	165	.10	1.64	20	5.4
FMP 0288	850909	5	8.21	85	150			20.43	4.1
FMP 0289	850909	25	8.18	87	158			21.77	4.4
FMP 0290	850909	80	8.13	98	160			21.63	5.4
FMP 0307	851008	5	8.17	89	164			20.51	2.1
FMP 0308	851008	10	8.14	88	163			21.26	2.4
FMP 0309	851008	25	8.09	90	161			20.86	2.7
FMP 0310	851008	70	7.98	90	166			22.25	3.4
FMP 0318	851111	5	8.17	89	156				4.5
FMP 0319	851111	10	8.17	90	157				4.4
FMP 0320	851111	25	8.15	88	155				4.4
FMP 0321	851111	80	8.08	92	160				4.8
FMP 0331	851209	5	8.06	90	160				4.9
FMP 0332	851209	10	8.04	90	162				4.7
FMP 0333	851209	25	8.13	92	157				4.6
FMP 0334	851209	80	8.09	91	162				4.6

Table A.I.32. Flathead Lake - Midlake deep, 1985. Flathead Basin Commission site # FBC05014. Concentration (ug/l) of selected metals.

Sample #	Date Coll	Depth	Ca	Mg	Fe
FMP 0145	850106	5	27.83	6.03	<.10
FMP 0146	850106	10	26.90	5.90	<.10
FMP 0147	850106	25	26.88	5.80	<.10
FMP 0148	850106	80	28.77	6.03	<.10
FMP 0157	850210	5	27.20	6.08	<.10
FMP 0158	850210	10	27.83	6.03	<.10
FMP 0159	850210	20	27.83	6.08	<.10
FMP 0168	850304	5	26.73	6.31	<.10
FMP 0169	850304	10	26.43	6.36	<.10
FMP 0170	850304	25	24.90	6.21	<.10
FMP 0171	850304	50	26.10	6.40	<.10
FMP 0203	850425	5	28.88	6.02	<.10
FMP 0204	850425	10	27.36	6.14	<.10
FMP 0205	850425	25	27.36	5.96	<.10
FMP 0206	850425	80	27.87	6.26	<.10
FMP 0213	850512	5	27.87	5.90	<.10
FMP 0214	850512	10	28.38	6.08	<.10
FMP 0215	850512	25	28.38	6.14	<.10
FMP 0216	850512	80	28.38	6.08	<.10
FMP 0226	850527	5	25.77	6.38	<.10
FMP 0227	850527	25	26.67	6.50	<.10
FMP 0228	850527	80	26.67	6.42	<.10
FMP 0238	850611	5	26.22	6.08	<.10
FMP 0239	850611	10	25.77	6.16	<.10
FMP 0240	850611	25	26.22	6.23	<.10
FMP 0241	850611	80	26.22	6.27	<.10
FMP 0247	850619	10	NR	NR	NR
FMP 0255	850701	5	23.90	5.76	<.10
FMP 0256	850701	10	24.13	5.51	<.10
FMP 0257	850701	25	25.95	5.89	<.10
FMP 0258	850701	80	25.50	6.78	<.10
FMP 0266	850729	5	23.86	4.87	<.10
FMP 0267	850729	10	23.86	6.02	<.10
FMP 0268	850729	25	25.24	6.02	<.10
FMP 0269	850729	80	25.70	3.85	<.10
FMP 0277	850826	5	25.50	6.28	<.10
FMP 0278	850826	10	25.04	6.28	<.10
FMP 0279	850826	25	25.95	6.43	<.10
FMP 0280	850826	80	26.41	6.74	<.10
FMP 0288	850909	5	25.50	6.35	<.10
FMP 0289	850909	25	25.95	6.43	<.10
FMP 0290	850909	80	26.16	6.51	<.10
FMP 0307	851008	5	29.08	6.83	<.10
FMP 0308	851008	10	23.55	6.89	<.10
FMP 0309	851008	25	29.08	6.75	<.10
FMP 0310	851008	70	30	6.99	<.10
FMP 0318	851111	5	30	7.03	<.10
FMP 0319	851111	10	30	6.87	<.10
FMP 0320	851111	25	31.84	7.03	<.10
FMP 0321	851111	80	29.08	6.91	<.10
FMP 0331	851209	5	30	6.83	<.10
FMP 0332	851209	10	29.08	6.59	<.10
FMP 0333	851209	25	30.92	6.99	<.10
FMP 0334	851209	80	30	6.91	<.10

Table A.I.33. Flathead Lake - Midlake deep, 1986. Flathead Basin Commission site # FBC05014. Concentration (ug/1) of selected nutrient and physical variables.

Sample #	Date	Dept	TP	SP	SRP	Turb.	TSS	NO_2	NO_3	NH_3	TKN
FMP 0342	860106	5	4.7	2.3	<1.0	.31	NR	.3	38	NR	72
FMP 0343	860106	10	5.1	2.1	<1.0	.25	NR	.4	40	NR	59
FMP 0344	860106	25	4.7	2.5	<1.0	.25	NR	.5	42	NR	62
FMP 0345	860106	1	5.3	2.3	<1.0	.25	NR	.4	38	NR	74
FMP 0355	860203	5	4.1	2.6	<1.0	.41	NR	.2	30	NR	74
FMP 0356	860203	10	5.4	3.0	<1.0	.42	NR	<.2	36	NR	66
FMP 0357	860203	25	5.0	2.2	<1.0	.36	NR	.3	32	NR	80
FMP 0358	860203	80	3.7	2.6	<1.0	.33	NR	<.2	48	NR	64
FMP 0371	860303	5	5.2	2.2	<1.0	.20	NR	.4	32	NR	73
FMP 0372	860303	10	5.6	3.3	<1.0	.22	NR	.3	49	NR	67
FMP 0373	860303	25	3.9	2.6	<1.0	.19	NR	.2	57	NR	57
FMP 0374	860303	80	3.9	2.6	<1.0	.27	NR	.2	59	NR	59
FMP 0386	860331	25	4.8	2.5	<1.0	.64	<.5	.2	67	<5	66
FMP 0387	860331	80	4.1	2.3	<1.0	.44	.6	<.2	56	<5	68
FMP 0396	860414	5	5.4	1.8	<1.0	1.3	.9	.2	47	<5	145
FMP 0397	860414	10	5.4	2.2	<1.0	1.3	1.3	.2	45	<5	79
FMP 0398	860414	25	5.2	2.0	<1.0	1.6	1.6	.2	46	<5	79
FMP 0399	860414	80	5.8	2.2	<1.0	1.3	.9	.2	58	<5	64
FMP 0408	860428	5	4.5	1.7	<1.0	.43	<.5	<.2	43	<5	84
FMP 0409	860428	10	4.1	1.7	<1.0	.46	<.5	<.2	45	<5	82
FMP 0410	860428	25	5.1	2.6	<1.0	.48	<.5	<.2	44	<5	84
FMP 0411	860428	80	4.3	LE	<1.0	.48	<.5	<.2	46	<5	73
FMP 0422	860512	5	5.2	2.5	<1.0	.51	.7	<.2	50	<5	79
FMP 0423	860512	10	5.0	2.0	<1.0	.54	.5	<.2	44	5	77
FMP 0424	860512	25	3.9	2.0	<1.0	.63	.5	<.2	41	6	83
FMP 0425	860512	80	4.6	1.8	<1.0	.53	<.5	.4	48	6	73
FMP 0434	860603	5	5.7	2.3	<1.0	.56	1.0	.5	19	<5	100
FMP 0435	860603	10	5.5	2.9	<1.0	.46	.8	.3	24	<5	98
FMP 0436	860603	25	4.9	3.3	<1.0	.68	.7	.7	40	<5	80
FMP 0437	860603	80	4.5	2.5	<1.0	.45	.6	.6	38	<5	105
FMP 0452	860617	2	3.5	1.9	<1.0	1.5	1.3	.4	13	<5	96
FMP 0453	860617	5	5.8	1.9	<1.0	1.8	1.9	.5	23	<5	109
FMP 0454	860617	60	6.0	2.5	<1.0	1.1	1.0	.4	29	11	87
FMP 0463	860630	5	5.0	2.8	<1.0	.40	1.2	.3	<10	6	95
FMP 0464	860630	13	5.8	2.2	<1.0	.40	1.3	.5	56	6	55
FMP 0465	860630	60	3.6	2.8	<1.0	.40	<.5	<.2	<10	<5	65
FMP 0474	860728	5	4.1	<1.0	<1.0	.52	NR	<.2	<10	<5	86
FMP 0475	860728	14	4.4	1.7	<1.0	.45	NR	<.2	<10	<5	83
FMP 0476	860728	60	4.6	1.7	<1.0	.42	NR	<.2	66	<5	57
FMP 0491	860902	5	3.0	2.8	<1.0	.34	NR	<.2	<10	5	86
FMP 0492	860902	17	4.5	3.0	<1.0	.37	NR	.2	<10	12	107
FMP 0493	860902	60	3.0	2.4	<1.0	.34	NR	.2	78	5	49

Table A.I.34. Flathead Lake - Midlake deep, 1986. Flathead Basin Commission site # FBC05014. Concentration (ug/1) of selected organics and physical variables.

Sample #	Date Coll	Depth	pH	Alk.	Cond.	NDOC	DOC	DIC	SiO_2
FMP 0342	860106	5	8.26	92	163				5.2
FMP 0343	860106	10	8.27	92	163				4.9
FMP 0344	860106	25	8.27	92	160				4.9
FMP 0345	860106	1	8.28	93	165				5.3
FMP 0355	860203	5	8.23	92	166				4.9
FMP 0356	860203	10	8.22	92	167				5
FMP 0357	860203	25	8.24	94	168				5
FMP 0358	860203	80	8.20	92	165				4.9
FMP 0371	860303	5	8.17	92	169				6.1
FMP 0372	860303	10	8.14	92	162				6.5
FMP 0373	860303	25	8.14	92	166				5.5
FMP 0374	860303	80	8.14	92	165				5.9
FMP 0386	860331	25	8.10	91	166				6.6
FMP 0387	860331	80	8.10	92	166				4.6
FMP 0396	860414	5	8.07	90	167				5.5
FMP 0397	860414	10	8.09	92	166				5.1
FMP 0398	860414	25	8.09	90	166				4.9
FMP 0399	860414	80	8.12	90	166				5.4
FMP 0408	860428	5	8.06	91	166				5.2
FMP 0409	860428	10	8.04	91	166				5.3
FMP 0410	860428	25	8.04	91	166				5.8
FMP 0411	860428	80	8.04	92	166				5.4
FMP 0422	860512	5	8.17	92	165				5.5
FMP 0423	860512	10	8.17	90	164				5.5
FMP 0424	860512	25	8.18	92	164				5.2
FMP 0425	860512	80	8.17	92	164				14.4
FMP 0434	860603	5	8.26	91	176				5.9
FMP 0435	860603	10	8.26	91	176				5.6
FMP 0436	860603	25	8.15	91	177				5.5
FMP 0437	860603	80	8.16	91	174				5.7
FMP 0452	860617	2	8.28	90	160				4.8
FMP 0453	860617	5	8.23	87	163				4.8
FMP 0454	860617	60	8.18	92	169				5.2
FMP 0463	860630	5	8.27	90	156				4.4
FMP 0464	860630	13	8.21	91	159				4.7
FMP 0465	860630	60	8.06	94	164				5.4
FMP 0474	860728	5	8.34	87	166				5.5
FMP 0475	860728	14	8.34	90	167				5.5
FMP 0476	860728	60	8.10	92	174				6.1
FMP 0491	860902	5	8.26	91	159				4.9
FMP 0492	860902	17	8.19	91	157				5.4
FMP 0493	860902	60	7.99	93	161				5.7

Table A.I.35. Flathead Lake - Midlake deep, 1986. Flathead Basin Commission site # FBC05014. Concentration (ug/l) of selected metals.

Sample #	Date Coll	Depth	Ca	Mg	Fe
FMP 0342	860106	5	28.94	6.59	<.10
FMP 0343	860106	10	29.92	6.74	.10
FMP 0344	860106	25	28.94	6.67	<.10
FMP 0345	860106	1	29.92	6.04	<.10
FMP 0355	860203	5	28.68	6.18	<.10
FMP 0356	860203	10	27.94	6.18	<.10
FMP 0357	860203	25	27.94	6.04	<.10
FMP 0358	860203	80	27.20	6.11	<.10
FMP 0371	860303	5	30.54	6.62	<.10
FMP 0372	860303	10	29.64	6.62	<.10
FMP 0373	860303	25	29.20	6.48	<.10
FMP 0374	860303	80	29.20	6.53	<.10
FMP 0386	860331	25	29.20	6.66	<.10
FMP 0387	860331	80	28.75	6.39	<.10
FMP 0396	860414	5	29.64	6.75	<.10
FMP 0397	860414	10	29.64	6.75	<.10
FMP 0398	860414	25	29.20	6.66	<.10
FMP 0399	860414	80	30.09	6.66	<.10
FMP 0408	860428	5	27.30	6.35	<.10
FMP 0409	860428	10	27.30	6.18	<.10
FMP 0410	860428	25	27.76	6.22	<.10
FMP 0411	860428	80	27.30	6.31	<.10
FMP 0422	860512	5	28.69	6.18	<.10
FMP 0423	860512	10	28.23	6.31	<.10
FMP 0424	860512	25	27.76	6.14	<.10
FMP 0425	860512	80	27.76	6.10	<.10
FMP 0434	860603	5	28.23	5.97	<.10
FMP 0435	860603	10	28.23	5.92	<.10
FMP 0436	860603	25	28.23	6.01	<.10
FMP 0437	860603	80	28.23	6.05	<.10
FMP 0452	860617	2	20.36	4.58	.10
FMP 0453	860617	5	21.59	4.96	<.10
FMP 0454	860617	60	19.54	4.58	<.10
FMP 0463	860630	5	25.69	6.12	<.10
FMP 0464	860630	13	27.33	6.08	<.10
FMP 0465	860630	60	27.33	6.25	<.10
FMP 0474	860728	5			
FMP 0475	860728	14			
FMP 0476	860728	60			
FMP 0491	860902	5			
FMP 0492	860902	17			
FMP 0493	860902	60			

Table A.I.36. Flathead River at Polson. Flathead Basin Commission site # FBC05021. Concentration (ug/l) of selected nutrient and physical variables.

Sample #	Date Coll	TP	SP	SRP	Turb.	TSS	NO_2	NO_3	NH_3	TKN
FLS 3846	771117	NR	NR	NR	NR	2.1	NR	NR	NR	NR
FLS 4129	771220	NR	NR	NR	NR	.9	NR	NR	NR	NR
FLS 4291	780125	NR	NR	NR	NR	.7	NR	NR	NR	NR
FLS XXX1	780215	NR	NR	NR	NR	.9	NR	NR	NR	NR
FLS 4742	780301	3.0	NR	NR	NR	.6	NR	10	NR	30
FLS 4741	780315	3.0	NR	NR	NR	.9	NR	40	NR	30
FLS 4989	780418	7.0	NR	NR	NR	1.7	NR	40	NR	20
FLS 4994	780524	12.0	NR	NR	NR	2.2	NR	<10	NR	20
FLS 5198	780615	11.0	NR	NR	NR	1.3	NR	40	NR	40
FLS 5179	780630	12.0	NR	NR	NR	1.3	NR	55	NR	75
FLS 5283	780715	7.0	NR	NR	NR	1.1	NR	90	NR	70
FLS 5314	780730	16.0	NR	NR	NR	1.6	NR	10	NR	60
FLS 5338	780815	9.0	NR	NR	NR	.6	NR	20	NR	80
FLS 5373	780830	6.0	NR	NR	NR	.2	NR	20	NR	60
FLS 5389	780930	8.0	NR	NR	NR	.7	NR	20	NR	60
FLS 5423	781030	11.0	NR	NR	NR	.6	NR	30	NR	<40
FLS 5457	781130	8.0	NR	NR	NR	.6	NR	<20	NR	170
FLS 5491	781218	8.0	NR	NR	NR	1.0	NR	50	NR	80
FLS 5538	790228	12.0	NR	NR	NR	.9	NR	90	NR	110
FLS 5541	790331	8.0	NR	NR	NR	1.0	NR	40	NR	100
FLS 5575	790509	2.9	NR	NR	NR	1.2	NR	18	NR	NR
FLS 5609	790610	3.5	NR	NR	NR	1.8	NR	19	NR	NR
FLS 5656	790627	5.4	NR	NR	NR	1.2	NR	14	NR	NR
FLS 5690	790712	5.6	NR	NR	NR	1.5	NR	16	NR	NR
FLS 5724	790830	5.2	NR	NR	NR	.3	NR	<20	NR	NR
FLS 5762	790928	5.3	NR	NR	NR	2.1	NR	<10	NR	NR
FLS 5765	791029	3.6	NR	NR	NR	1.3	NR	<10	NR	NR
FLS 5768	791129	4.8	NR	NR	NR	.8	NR	NR	NR	NR
FLS 5771	800105	4.8	NR	NR	NR	8.9	NR	38	NR	NR
FLS 5774	800125	4.6	NR	NR	NR	4.4	NR	27	NR	NR
FLS 5777	800307	4.1	NR	NR	NR	1.7	NR	<10	NR	NR
FLS 5780	800331	NR	NR	NR	NR	.8	NR	20	NR	NR
FLS 5783	800429	3.4	NR	NR	NR	6.3	NR	26	NR	NR
FLS 5801	800512	NR	NR	NR	NR	4.2	NR	16	NR	NR
FLS 5829	800527	14.0	NR	NR	NR	1.5	NR	34	NR	NR
FLS 5842	800625	6.0	NR	NR	NR	2.3	NR	18	NR	NR
FRS 3133	810409	7.7	NR	<1.0	NR	NR	NR	NR	NR	119
FLS 5973	810508	5.3	NR	<1.0	NR	.9	NR	<20	NR	83
FLS 5996	810529	7.0	NR	<1.0	NR	1.1	NR	<20	NR	125
FLS 6002	810616	6.4	NR	<1.0	NR	2.2	NR	<20	NR	104
FLS 6007	810728	3.7	NR	NR	NR	1.6	NR	<20	NR	112
FLS 6014	811006	4.9	NR	<1.0	NR	<.5	NR	<20	NR	141
FLS 6021	811111	4.1	NR	<1.0	NR	<.5	NR	<20	NR	85
FLS 6025	811209	4.1	NR	<1.0	NR	1.5	NR	<20	NR	138

Table A.I.36. (continued)

Sample #	Date Coll	TP	SP	SRP	Turb.	TSS	NO_2	NO_3	NH_3	TKN
FLS 6052	820525	7.9	NR	<1.0	.40	1.3	NR	<20	NR	NR
FLS 6065	820713	5.0	NR	<1.0	.70	NR	NR	<20	NR	NR
FLS 6071	820809	9.0	NR	<1.0	1.10	NR	NR	<20	NR	NR
FLS 6076	820907	3.7	NR	<1.0	.30	NR	NR	<20	NR	NR
FLS 6081	821101	5.2	NR	<1.0	1.10	NR	<1.0	<20	NR	NR
FLS 6087	821206	4.1	NR	<1.0	.50	NR	<1.0	<20	NR	NR
FLS 6094	830126	5.7	NR	<1.0	.35	NR	<1.0	<20	NR	NR
FLS 6102	830302	12.9	NR	<1.0	.80	NR	NR	<20	NR	NR
FLS 6108	830413	6.5	NR	<1.0	.70	NR	<1.0	<20	NR	NR
FLS 6114	830504	7.2	NR	<1.0	.60	NR	<1.0	<20	NR	NR
FMP 0006	840131	4.0	3.3	<1.0	.40	NR	LE	<20	NR	64
FMP 0016	840306	3.6	3.9	<1.0	.40	NR	.5	<20	NR	94
FMP 0026	840402	3.4	5.5	<1.0	.80	NR	<.5	<20	NR	81
FMP 0044	840429	5.6	1.6	<1.0	1.10	2.1	<.5	6	NR	93
FMP 0054	840514	3.5	<1.0	<1.0	1.10	4.3	<.5	5	NR	106
FMP 0064	840520	7.2	1.2	<1.0	.80	NR	.5	9	NR	93
FMP 0074	840625	6.0	1.7	<1.0	NR	NR	NR	<20	NR	NR
FMP 0079	840725	5.4	<1.0	<1.0	.50	NR	<.8	<20	NR	NR
FMP 0095	840806	4.0	<1.0	<1.0	.40	NR	<.8	<20	NR	98
FMP 0101	840905	4.4	1.8	<1.0	.50	NR	<.8	<5	NR	117
FMP 0112	841004	4.6	2.1	<1.0	.50	NR	<.8	<20	NR	90
FMP 0122	841112	4.8	2.0	<1.0	.40	NR	<.8	<20	NR	82
FMP 0133	841209	4.5	2.9	<1.0	.50	NR	<.8	<20	NR	71
FMP 0144	850106	2.6	2.2	<1.0	.30	NR	<1.0	20	NR	65
FMP 0156	850210	5.7	2.1	<1.0	.30	NR	<1.0	30	NR	68
FMP 0167	850304	5.6	2.2	<1.0	.50	NR	<1.0	24	NR	88
FMP 0185	850401	7.6	2.1	<1.0	.50	NR	<.5	<20	NR	72
FMP 0197	850424	7.6	2.2	<1.0	.50	1.4	<.5	24	NR	62
FMP 0207	850512	6.7	3.3	<1.0	.40	NR	<.5	26	NR	77
FMP 0229	850528	6.6	2.8	<1.0	.90	1.2	<.5	19	NR	152
FMP 0237	850611	10.5	4.3	<1.0	.50	1.4	<.5	<20	NR	62
FMP 0254	850630	5.5	2.9	<1.0	1.20	1.8	.6	<10	NR	158
FMP 0265	850729	7.1	1.0	<1.0	1.00	NR	<.2	<10	NR	91
FMP 0276	850826	4.0	2.1	<1.0	.50	NR	<.2	<10	NR	96
FMP 0287	850909	4.5	2.1	<1.0	.60	NR	<.2	<10	NR	85
FMP 0302	851006	4.1	2.7	<1.0	.50	NR	<.2	<10	NR	78
FMP 0322	851111	3.8	2.7	<1.0	.56	NR	.2	32	NR	79
FMP 0329	851209	4.7	3.1	<1.0	.34	NR	.2	37	NR	68
FMP 0340	860106	3.6	1.7	<1.0	.27	NR	.4	42	NR	65
FMP 0353	860204	5.8	2.4	<1.0	.64	NR	.3	44	NR	81
FMP 0369	860303	5.8	2.4	<1.0	.26	NR	.5	28	NR	82
FMP 0382	860401	5.0	2.9	<1.0	.69	1.4	.3	53	<5	72
FMP 0394	860414	6.3	2.0	<1.0	1.30	1.4	.2	22	<5	96
FMP 0406	860429	4.1	1.9	<1.0	.52	.8	<.2	34	<5	84
FMP 0420	860513	6.2	2.5	<1.0	1.30	1.7	.2	27	<5	108
FMP 0432	860604	3.3	2.7	<1.0	1.00	1.4	.4	10	<5	107
FMP 0450	860617	5.8	1.9	<1.0	1.50	1.5	.3	<10	6	113
FMP 0461	860701	6.0	2.2	<1.0	.52	2.3	<.2	<10	8	128

Table A.I.37. Flathead River at Polson. Flathead Basin Commission site # FBC05021. Concentration (ug/l) of selected organic and physical variables.

Sample #	Date Coll	pH	Cond.	Alk.	NDOC	DOC	DIC	SiO_2
FMP 0006	840131	8.12	147	79	.20	1.74	NR	5.3
FMP 0016	840306	8.10	NR	89	.27	1.30	NR	4.7
FMP 0026	840402	8.06	161	98	.27	1.65	NR	4.8
FMP 0044	840429	8.13	150	93	.25	.95	NR	4.5
FMP 0054	840514	8.13	152	91	.30	1.83	NR	4.5
FMP 0064	840520	8.09	158	92	.26	1.11	17.97	4.9
FMP 0074	840625	NR	NR	NR	NR	NR	NR	4.5
FMP 0079	840725	NR	154	97	NR	NR	NR	5.1
FMP 0095	840806	8.41	160	97	.34	2.96	20.46	5.5
FMP 0101	840905	8.32	153	85	.37	LE	19.70	4.9
FMP 0112	841004	8.27	143	86	.30	1.22	21.60	5
FMP 0122	841112	8.18	161	91	.20	.98	20.17	5.1
FMP 0133	841209	8.13	168	94	.23	.94	20.01	5
FMP 0144	850106	8.16	163	90	.16	1.89	19.16	5.6
FMP 0156	850210	8.22	162	90	.15	1.02	11.40	4.6
FMP 0167	850304	8.22	170	92	.21	1.36	22.20	5
FMP 0185	850401	8.18	165	88	.21	1.15	NR	5
FMP 0197	850424	8.18	159	90	.19	1.26	NR	4.9
FMP 0207	850512	8.15	147	89	.18	.96	NR	5.4
FMP 0229	850528	8.18	164	90	.19	1.22	23.70	4.5
FMP 0237	850611	8.27	150	87	.29	1.28	22.96	5.6
FMP 0254	850630	8.46	140	85	.31	1.35	19.90	4.2
FMP 0265	850729	7.98	161	88	.27	1.39	17.90	4.1
FMP 0276	850826	8.25	157	87	.23	1.42	19.70	4.3
FMP 0287	850909	8.18	151	85			20.88	4.4
FMP 0302	851006	8.14	167	92			22.33	3.9
FMP 0322	851111	8.17	154	90				4.1
FMP 0329	851209	8.12	165	94				4.9
FMP 0340	860106	8.24	165	94				5
FMP 0353	860204	8.20	161	94				5.2
FMP 0369	860303	8.17	166	92				5.4
FMP 0382	860401	8.20	165	89				5
FMP 0394	860414	8.15	164	87				5.1
FMP 0406	860429	8.12	161	90				5.3
FMP 0420	860513	8.20	165	92				5.3
FMP 0432	860604	8.36	174	95				5.8
FMP 0450	860617	8.30	162	90				4.7
FMP 0461	860701	8.34	159	90				5.1
FMP 0472	860729	8.45	166	90				5.4
FMP 0489	860902	8.28	158	90				5.5

Table A.I.38. Flathead River at Polson. Flathead Basin Commission site # FBC05021. Concentration (ug/l) of selected metals.

Sample #	Date Coll	Ca	Mg	Fe
FMP 0006	840131	26.04	6.59	<.10
FMP 0016	840306	24.48	6.47	.18
FMP 0026	840402	26.10	6.17	<.10
FMP 0044	840429	25.05	6.22	<.10
FMP 0054	840514	26.35	7.41	<.10
FMP 0064	840520	29.01	6.75	<.10
FMP 0074	840625	NR	NR	NR
FMP 0079	840725	NR	NR	NR
FMP 0095	840806	NR	NR	NR
FMP 0101	840905	26.02	6.21	<.10
FMP 0112	841004	24.62	6.79	<.10
FMP 0122	841112	25.19	6.50	<.10
FMP 0133	841209	26.88	6.08	<.10
FMP 0144	850106	27.20	6.08	<.10
FMP 0156	850210	27.83	5.94	<.10
FMP 0167	850304	27.34	6.41	<.10
FMP 0185	850401	28.87	6.30	<.10
FMP 0197	850424	27.36	6.08	<.10
FMP 0207	850512	29.40	5.99	<.10
FMP 0229	850528	25.32	6.35	<.10
FMP 0237	850611	25.77	6.27	<.10
FMP 0254	850630	25.04	6.02	<.10
FMP 0265	850729	23.86	5.64	<.10
FMP 0276	850826	25.04	6.12	<.10
FMP 0287	850909	26.41	6.67	<.10
FMP 0302	851006	29.08	6.83	<.10
FMP 0322	851111	29.08	6.95	<.10
FMP 0329	851209	30	6.99	<.10
FMP 0340	860106	29.92	6.74	<.10
FMP 0353	860204	28.68	6.18	<.10
FMP 0369	860303	30.54	6.71	<.10
FMP 0382	860401	28.75	6.57	<.10
FMP 0394	860414	29.20	6.57	<.10
FMP 0406	860429	27.30	6.18	<.10
FMP 0420	860513	28.23	6.18	<.10
FMP 0432	860604	28.23	6.10	<.10
FMP 0450	860617	19.13	4.54	<.10
FMP 0461	860701	26.51	6.12	<.10
FMP 0472	860729			
FMP 0489	860902			

Table A.I.39. Bulk precipitation at Yellow Bay. Concentration (ug/l) of selected nutrient variables.

Sample #	Site #	Date	TP	SP	SRP	NO_2-N	NO_3-N	NH_3-N	TKN
ARS 0101	BSC05018	810501	41.0	NR	NR	NR	150	NR	275
ARS 0099	BSC05016	810501	35.3	NR	1.7	NR	180	NR	291
ARS 0100	FBC05024	810501	40.0	NR	2.7	NR	170	NR	319
ARS 0140	BSC05018	810521	76.0	NR	NR	NR	170	NR	713
ARS 0141	BSC05016	810521	18.1	NR	3.4	NR	110	NR	199
ARS 0142	FBC05024	810521	16.4	NR	4.4	NR	100	NR	137
ARS 0143	BSC05018	810522	26.0	NR	NR	NR	140	NR	588
ARS 0144	BSC05016	810522	10.9	NR	<1.0	NR	150	NR	393
ARS 0145	FBC05024	810522	10.5	NR	1.9	NR	150	NR	362
ARS 0161	BSC05018	810601	78.2	NR	NR	NR	110	NR	613
ARS 0162	BSC05016	810601	19.7	NR	<1.0	NR	500	NR	322
ARS 0163	FBC05024	810601	22.1	NR	5.9	NR	140	NR	384
ARS 0186	BSC05018	810629	43.0	NR	NR	NR	180	NR	602
ARS 0185	BSC05016	810629	65.0	NR	25.9	NR	98	NR	520
ARS 0184	FBC05024	810629	48.0	NR	15.9	NR	100	NR	403
ARS 0445	BSC05018	810801	200.0	NR	NR	NR	<20	NR	1050
ARS 0446	BSC05016	810801	274.0	NR	57.0	NR	200	NR	NR
ARS 0447	FBC05024	810801	138.0	NR	8.9	NR	240	NR	NR
ARS 0506	BSC05018	810901	570.0	NR	NR	NR	110	NR	2083
ARS 0505	BSC05016	810901	309.0	NR	238.0	NR	290	NR	NR
ARS 0507	FBC05024	810901	124.0	NR	37.0	NR	300	NR	729
ARS 0508	BSC05016	811001	243.0	NR	178.0	NR	300	NR	1493
ARS 0509	FBC05024	811001	437.0	NR	201.0	NR	360	NR	1396
ARS 0513	BSC05018	811102	394.0	NR	NR	NR	60	NR	1434
ARS 0512	BSC05016	811102	79.4	NR	32.2	NR	27	NR	NR
ARS 0514	FBC05024	811102	231.0	NR	138.0	NR	420	NR	NR
ARS 0624	BSC05018	811130	100.0	NR	NR	NR	<20	NR	139
ARS 0623	BSC05016	811130	17.6	NR	2.7	NR	90	NR	174
ARS 0625	FBC05024	811130	41.9	NR	16.6	NR	100	NR	308
ARS 0628	FBC05024	811217	4.2	NR	<1.0	NR	90	NR	75
ARS 0630	BSC05018	820101	NR	NR	NR	NR	<20	NR	158
ARS 0629	BSC05016	820101	NR	NR	8.2	NR	76	NR	242
ARS 0631	FBC05024	820101	NR	NR	3.1	NR	95	NR	385
ARS 0633	BSC05016	820125	NR	NR	3.8	NR	137	NR	170
ARS 0632	FBC05024	820125	NR	NR	3.2	NR	NR	NR	245
ARS 0703	BSC05018	820301	20.8	NR	NR	NR	70	NR	223
ARS 0702	BSC05016	820301	8.5	NR	4.0	NR	180	NR	322
ARS 0704	FBC05024	820301	38.1	NR	<1.0	NR	150	NR	298
ARS 0724	BSC05018	820401	51.4	NR	NR	NR	140	NR	NR
ARS 0722	BSC05016	820401	20.1	NR	<1.0	NR	170	NR	NR
ARS 0723	FBC05024	820401	14.2	NR	1.1	NR	180	NR	NR
ARS 0748	BSC05018	820503	110.0	NR	NR	<1.5	67	NR	NR
ARS 0747	BSC05016	820503	38.4	NR	26.8	<1.5	71	NR	NR
ARS 0749	FBC05024	820503	5.9	NR	<1.0	<1.5	89	NR	NR
ARS 0753	BSC05018	820601	533.0	NR	NR	NR	150	NR	NR

Table A.I.39. (continued)

Sample #	Site #	Date	TP	SP	SRP	NO_2-N	NO_3-N	NH_3-N	TKN
ARS 0752	BSC05016	820601	435.0	NR	260.0	NR	180	NR	NR
ARS 0754	FBC05024	820601	72.0	NR	11.3	NR	220	NR	NR
ARS 0759	BSC05016	820701	204.0	NR	50.8	<1.0	85	NR	NR
ARS 0761	FBC05024	820701	164.0	NR	27.5	<1.0	410	NR	NR
ARS 0769	BSC05016	820723	13.2	NR	NR	NR	<20	NR	333
ARS 0770	FBC05024	820723	33.2	NR	NR	NR	81	NR	407
WLS 0059	BSC04003	830410	13.3	NR	NR	NR	120	NR	231
WLS 0060	BSC04004	830410	68.9	NR	NR	NR	133	NR	853
WLS 0068	BSC04003	830508	536.8	NR	NR	NR	47	NR	1221
WLS 0069	BSC04004	830508	462.6	NR	NR	NR	71	NR	2052
WLS 0087	BSC04003	830606	231.1	NR	NR	NR	119	NR	1254
WLS 0088	BSC04004	830606	886.8	NR	NR	NR	<20	NR	NR
WLS 0098	BSC04003	830629	170.1	NR	NR	NR	21	NR	668
WLS 0099	BSC04004	830629	158.0	NR	NR	NR	21	NR	783
WLS 0100	BSC04003	830710	61.6	NR	NR	NR	96	NR	474
WLS 0101	BSC04004	830710	83.1	NR	NR	NR	90	NR	429
WLS 0110	BSC04003	830806	44.1	NR	NR	NR	66	NR	364
WLS 0111	BSC04004	830806	116.5	NR	NR	NR	<20	NR	711
WLS 0112	BSC04003	830826	15.7	NR	NR	NR	101	NR	401
WLS 0113	BSC04004	830826	127.1	NR	NR	NR	154	NR	866
WLS 0122	BSC04003	830913	45.6	NR	NR	NR	79	NR	316
WLS 0123	BSC04004	830913	102.7	NR	NR	NR	101	NR	359
WLS 0132	BSC04003	831031	190.0	NR	NR	NR	<20	NR	812
WLS 0133	BSC04004	831031	670.7	NR	NR	NR	<20	NR	835
WLS 0134	BSC04003	831210	66.4	NR	NR	NR	22	NR	NR
WLS 0135	BSC04004	831210	132.8	NR	NR	NR	<20	NR	139
FMP 0106	FBC05024	840928	13.4	4.3	3.8	2.1	164	NR	263
FMP 0127	FBC05024	841113	29.6	<1.0	<1.0	<.8	128	31	344
FMP 0138	FBC05024	841212	4.7	3.3	2.4	<.8	118	144	147
FMP 0149	FBC05024	850106	8.9	5.2	4.3	1.7	177	107	226
FMP 0150	FBC05024	850106	9.5	6.0	4.9	2.6	170	108	189
FMP 0160	FBC05024	850210	9.1	6.6	6.6	3.6	233	176	170
FMP 0161	FBC05024	850210	8.0	7.1	6.6	3.6	243	175	170
FMP 0172	FBC05024	850319	33.3	NR	NR	NR	NR	NR	568
FMP 0195	FBC05024	850401	9.0	4.5	NR	NR	NR	NR	482
FMP 0202	FBC05024	850424	69.4	23.1	NR	NR	NR	NR	718
FMP 0242	FBC05024	850530	45.8	12.3	5.3	3.6	105	51	354
FMP 0259	FBC05024	850701	40.9	22.2	15.3	<.5	50	70	460
FMP 0270	FBC05024	850804	324.0	243.3	209.3	2.4	390	6	1290
FMP 0281	FBC05024	850826	50.3	36.6	27.8	2.1	274	243	680
FMP 0297	FBC05024	850910	58.4	44.3	37.4	<.2	128	LE	167
FMP 0305	BSC05016	851007	10.0	5.0	3.7	.2	95	53	189
FMP 0306	BSC05016	851007	9.9	4.1	3.4	.7	97	54	172
FMP 0311	BSC05016	851111	12.3	3.8	2.0	1.8	126	162	279
FMP 0323	BSC05016	851204	11.2	1.4	1.8	.5	257	100	172
FMP 0346	BSC05016	860106	11.7	3.1	2.1	1.7	197	19	72
FMP 0347	BSC05016	860128	2.8	<1.0	<1.0	1.7	57	41	74
FMP 0360	BSC05016	860204	1.1	<1.0	<1.0	2.7	103	37	90

Table A.I.39. (continued)

Sample #	Site #	Date	TP	SP	SRP	NO_2-N	NO_3-N	NH_3-N	TKN
FMP 0361	BSC05016	860204	2.6	<1.0	<1.0	2.4	95	36	85
FMP 0362	BSC05016	860215	5.2	<1.0	<1.0	1.3	95	10	61
FMP 0363	BSC05016	860215	2.8	<1.0	<1.0	1.1	92	17	38
FMP 0375	BSC05016	860304	3.4	<1.0	<1.0	1.0	55	7	75
FMP 0376	BSC05016	860317	18.5	1.0	<1.0	6.5	140	53	LE
FMP 0388	BSC05016	860401	8.2	<1.0	<1.0	3.8	98	84	237
FMP 0400	BSC05016	860415	51.1	2.2	<1.0	LE	483	LE	789
FMP 0412	BSC05016	860429	9.9	3.8	2.7	2.6	123	200	293
FMP 0413	BSC05016	860429	12.8	5.1	3.6	3.0	112	193	292
FMP 0414	BSC05016	860505	9.0	1.2	<1.0	1.3	76	79	139
FMP 0426	BSC05016	860519	97.0	46.9	43.0	1.3	362	70	626
FMP 0438	BSC05016	860604	179.6	93.2	89.1	9.1	143	1278	2337
FMP 0455	BSC05016	860613	24.7	2.6	1.5	3.1	92	14	207
FMP 0466	BSC05016	860701	102.0	3.6	<1.0	<.2	<10	<5	831
FMP 0477	BSC05016	860728	36.2	22.4	18.4	3.4	246	111	333
FMP 0494	BSC05016	860903	99.3	8.7	<1.0	<.2	<10	5	
FMP 0495	BSC05016	860910	11.5	7.3	4.5	2.0	77	96	

Table A.I.40. Bulk precipitation at Yellow Bay. Concentration (ug/l) of selected organic and metal variables.

Sample #	Date Coll	TOC	Cl	SO_4	DAl	TAl
FMP 0106	840928	3.49	.42	2.34	NR	120
FMP 0127	841113	5.42	.14	.75	81	73
FMP 0138	841212	9	.14	.33	57	19
FMP 0149	850106	1.18	1.11	.57	NR	40
FMP 0150	850106	1.33	.17	.54	4	36
FMP 0160	850210	1.36	LE	LE	6	15
FMP 0161	850210	1.42	LE	LE	7	18
FMP 0172	850319	3.61	NR	NR	NR	NR
FMP 0195	850401	NR	NR	NR	NR	NR
FMP 0202	850424	18.25	NR	NR	NR	NR
FMP 0242	850530	2.69	<.10	.30	3.2	23
FMP 0259	850701	1.13	.20	.30	<3.0	39.4
FMP 0270	850804	8.19	.30	1.29	30.8	124
FMP 0281	850826	3.75	.15	.87	59.5	137
FMP 0297	850910	3.97	.12	.42	53.5	113
FMP 0305	851007	6.26	<.10	.39	4.6	15.8
FMP 0306	851007	3.91	<.10	.39	6.3	14.9
FMP 0311	851111		.35	.54	51.2	43.1
FMP 0323	851204		.27	.69	26.2	67
FMP 0346	860106		.13	.42	6.4	20.0
FMP 0347	860128		<.10	.27		
FMP 0360	860204		.10	.24		
FMP 0361	860204		.13	.27		
FMP 0362	860215		<.10	.15		
FMP 0363	860215		.30	.21		
FMP 0375	860304		<.10	.21		
FMP 0376	860317		.21	.57	LE	LE
FMP 0388	860401		.24	.54		
FMP 0400	860415		.44	2.04		
FMP 0412	860429		.11	.81		
FMP 0413	860429		.14	.81		
FMP 0414	860505		.12	.30		
FMP 0426	860519		.30	1.38		
FMP 0438	860604		.24	.69		
FMP 0455	860613		.28	.36		
FMP 0466	860701		.28	.69		
FMP 0477	860728		.24	.78		
FMP 0494	860903		.11	.46		
FMP 0495	860910		.59	.31		

Flathead Lake Biological Station

Selected Reports since 1983

1. Henry, R. L. and J. A. Stanford. 1983. A simulation study of Flathead Lake phosphorus dynamics. Open File Report.

2. Stanford, J. A., T. J. Stuart and B. K. Ellis. 1983. Limnology of Flathead Lake: Final Report. Open File Report.

3. Golnar, T. F. and J. A. Stanford. 1984. Limnology of Whitefish Lake, Montana. Open File Report.

4. Stanford, J. A. 1984. Land use and groundwater quality in Western Montana: The impact on nutrient budgets for surface waters. Research Project Technical Completion Report, Montana Water Resources Research Center, Montana State Univesity, Bozeman, MT. 33 p.

5. Ellis, B. K., J. A. Stanford and R. T. Bukantis. 1985. Monitoring limnology of Flathead Lake. Progress Report.

6. Jourdonnais, J. H. and J. A. Stanford. 1985. Verification of shoreline sewage leachates in Flathead Lake, Montana. Open File Report.

7. Kicklighter, D. W. and J. A. Stanford. 1985. The use of riffle community metabolism as a measure of water quality degradation in the Clark Fork River, Montana. Open File Report.

8. Stanford, J. A., B. K. Ellis, G. R. Gregory and L. F. Marnell. 1985a. Monitoring water quality of selected lakes in Glacier National Park, Montana. Progress Report.

9. Stanford, J. A., L. E. Hughes, and J. H. Jourdonnais. 1985b. Analytical methodology and quality control procedures used in the Freshwater Research Laboratory (2nd Edition). Open File Report.

10. Ellis, B. K., J. A. Stanford, G. R. Gregory and L. F. Marnell. 1986. Monitoring water quality of selected lakes in Glacier National Park, Montana. Progress Report.

11. Ellis, B. K. and J. A. Stanford. 1986. Bio-availability of phosphorus fractions in Flathead Lake and its tributary waters. Open File Report.

12. Hauer, F. R., C. A. S. Hall, J. H. Jourdonnais, M. Lorang, and J. A. Stanford. 1986. Assessing the effects of water regulation on aspects of the ecology of Flathead Lake. Progress Report.

13. Jourdonnais, J. H., J. A. Stanford, F. R. Hauer and R. A. Noble. 1986. Investigation of septic contaminated groundwater seepage as a nutrient source to Whitefish Lake, Montana. Open File Report.

14. Noble, R. A. and J. A. Stanford. 1986. Groundwater resources and water quality of the unconfined aquifers in the Kalispell Valley, Montana. Open File Report.

SECTION A

WATER QUALITY

Part II.

Water Quality Data collected by Flathead National Forest, United States Forest Service, 1935 3rd Ave E, Kalispell, MT 59901.

Table A.II.1 FLATHEAD NATIONAL FOREST 1986 WATER QUALITY MONITORING SCHEDULE AND TARGETS

STATION NAME	STORET NUMBER	FLTD BASIN NUMBER	STATION TYPE	April 7	14	21	28	May 5	12	19	26	June 2	9	16	23	30	July 7	14	21	28	Aug 11	25	Sep 8	22	Oct. 6	20	Nov 3	X	F	B	M	A	G	T
SWAN LAKE R.D.																																		
Lion*	FL1021	FBC6002	B									Establish suitable site in summer																						
Krause	FL1026	FBC6006	B	X		X			X		X	X	X	X			X		X			X		X	X		X	X	15	15				
SPOTTED BEAR R.D.																																		
Whitcomb, L.	FL4001	FBC2003	A**						X	X	X	X	X	X	X	X	X		X	X	X		X		X	X	16							
Whitcomb, Up.	FL4005	FBC2002	B**						X	X	X	X	X	X	X	X	X		X	X	X		X		X	X	16							
Whitcomb,W.F.	FL4024	FBC2005	B**						X	X	X	X	X	X	X	X	X		X	X	X		X		X	X	16							
Sullivan*	FL4004	FBC2008	A						X	X	X	X	X	X	X	X	X		X	X	X		X		X	X	16							
Spotted Bear R.		FBC2005	I				M	M		M			M		M			M	M	M	M	M		M	M	M				15			
Flathead R, S.F.			I				M	M		M			M		M			M	M	M	M	M		M	M	M				15			
Hungry Horse R.D.																																		
Wounded Buck,U	FL6014	FBC3007	B**						X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	19							
Wounded Buck,L	FL6003		A**						X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	19							
Challenge*	FL6005	FBC3006	A**						X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	19	19	19					
Dodge	FL6012		A**						X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	19							
Skyland	FL6009		A**						X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	19	19						
Skyland,W.F.	FL6010		A**						X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	19							
Graves @ Gage	FL6016		B														Water quantity station																8	
Graves,U.(KV)	FL6015		A					Establish and monitor when KV funds become available																													
H.F. AB Blnkshp		FBC3013	I		M				M		M			M		M		M	M	M	M	M		M	M				15				
GLACIER VIEW R.D.																																		
Big, L.	FL7004	FBC1018	A				X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	20	20	20	90	16	16		
Coal,N.F.*	FL7009	FBC1018	A**				X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	20		20					
Coal,S.F.*	FL7010	FBC1015	A**				X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	20		20					
Coal, L.*	FL7011	FBC1014	A**				X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	20	20	20	90	16	16		
Whale,L.	FL7002	FBC1012	A				X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	20	20	20	90	16	16		
N.F. AB Blnkshp			I		M				M		M			M		M		M	M	M	M	M		M	M				15				
Big @ Ski Lift			A			X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	20							
TALLY LAKE R.D.																																		
Fish *	FL8009		A	X		X	X	X	X	X	X	X	X	X	X	X	X	X		X		X		X		X	X	19							
Hand Snotel	FL8010	FBC4004	B**	X		X	X	X	X	X	X	X	X	X	X	X	X	X		X		X		X		X	X	19	19	19	90	16	8		
Squaw Mdw Trib	FL8021	FBC4006	A**	X		X	X	X	X	X	X	X	X	X	X	X	X	X		X		X		X		X	X	19	19	19	90	16	8		
Squaw Mdw	FL8020	FBC4005	A**	X		X	X	X	X	X	X	X	X	X	X	X	X	X		X		X		X		X	X	19							
GREGG (KV)	FL8002		A	X		X	X	X	X	X	X	X	X	X	X	X	X	X		X		X		X		X	X	19							
TOTALS																													408	151	157	60	450	88	64
																													X	F	B	M	A	G	T

STATION TYPES: B = Baseline, A = Activity, I = Inventory

* = Fish Habitat Stations. Others not listed include: Squeezer, Elk, Goat, Granite, Morrison, Hungry Horse, Upper Big, and Trail Creeks.

** = Paired stations.

X = Total suspended sediment (TSS), stream discharge, dissolved oxygen, turbidity, pH, specific conductance; integrated samples

P = Total Phosphorus + X as above

B = Bedload sample

M = Microbiological tests (Fecal and fecal strep. coliform counts) + turbidity ; grab sample

A = Automatic sediment samples: TSS turbidity, specific conductance

G = Continuous recording water lever recorder and automatic sediment sampler site visits

T = Continuous recording thermograph site visits

FLATHEAD NATIONAL FOREST WATER QUALITY MONITORING

Since the mid-1970's, the Flathead National Forest has been actively monitoring water quality. The primary purpose originally was to characterize the water quality for broad land management planning needs. At 20-some stations, inventory level monitoring with low frequency seasonal sampling was done. Common dissolved constituents and suspended sediment concentrations were analyzed. Since then, more emphasis has been put on project or management activity monitoring. This is also required in our Forest Management Plan. Our data base (1974-1986) is in the EPA supported STORET system. Data are stored at 84 STORET stations.

Stations have been added or dropped over the years to fit management's needs and current year budgets. In 1986 twenty-six stations were monitored. Eighteen of these are identified in the Flathead Basin Monitoring Plan and six compliment fish habitat monitoring.

The Forest is currently analyzing sediment and stream discharge data. Average annual sediment yields (tons/yr.) will be estimated at several baseline and developed watersheds. This information will help us assign coefficients for sediment yield modeling. We plan to analyze changes in annual yield or changes in sediment rating curves to determine effects of management on sediment yield. The timing of sediment production as it relates to fisheries and channel bottom fine sand accumulation should also be analyzed.

Information from new variables tested for in 1986 should be of interest to the Basin Commission. These are total phosphorus and sediment load to streamflow relationships at seven stations and bacteria counts through the high recreational use season at four stations on the Wild and Scenic Rivers.

Some examples of graphics and STORET retrievals that we plan to use in data analysis follow.

WALLACE L. PAGE
Hydrologist

Table A.II.2 Inventory of Flathead National Forest Water Quality Stations, Samples, and Observations 1974-1986

	STA BEG	STA END	# OF OBS	# OF SAMPLE	STA END-PERIOD OF RECD IN YRS =0	<.5	<3	>=3
<1967	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0
1974	9	0	477	44	0	0	0	0
1975	1	0	1896	150	0	0	0	0
1976	23	0	2564	132	0	0	0	0
1977	9	0	2619	116	0	0	0	0
1978	7	0	6032	240	0	0	0	0
1979	7	0	1983	137	0	0	0	0
1980	14	21	7626	482	0	7	2	12
1981	3	32	3637	303	0	0	6	26
1982	3	3	2328	181	0	0	0	3
1983	2	0	3067	242	0	0	0	0
1984	0	0	1605	189	0	0	0	0
1985	1	2	2197	239	0	0	0	2
1986	5	26	3902	383	0	5	1	20
TOTAL	84	84	39933	2838	0	12	9	63

Table A.II.3 1986 Inventory--Flathead National Forest

26 TOTAL STATIONS PROCESSED

PARAMETER				MEDIUM	RMK	NUMBER	MEAN	VARIANCE	STAN DEV	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010	WATER	TEMP	CENT	WATER		1	6.000000			6.0	6.0	86/05/21	86/05/21
00011	WATER	TEMP	FAHN	WATER		344	45.14300	43.41800	6.589200	62.0	31.0	86/04/01	86/10/22
00020	AIR	TEMP	CENT	WATER		5	9.000000	18.12500	4.257400	15.0	3.0	86/04/23	86/05/21
00021	AIR	TEMP	FAHN	WATER		343	59.33200	140.4700	11.85200	92.0	33.0	86/04/01	86/10/22
00055	STREAM	VELOCITY	FT/SEC	WATER		313	1.869400	1.860400	1.356600	7.0	.01	86/04/01	86/10/22
00060	STREAM	FLOW	CFS	WATER		313	72.92400	21891.00	147.9600	1035	.005	86/04/01	86/10/22
					J	16	82.47500	9694.300	98.46000	285	.01	86/04/11	86/09/08
					TOT	329	73.38800	21270.00	145.8400	1035	.005	86/04/01	86/10/22
00065	STREAM	STAGE	FEET	WATER		242	1.310200	.7841400	.8855200	4.01	.01	86/04/01	86/10/22
00076	TURB	TRNSMTR	HACH FTU	WATER		340	3.852400	329.5100	18.15300	145.0	.08	86/04/01	86/10/22
					L	15	.5386700	.0811700	.2849000	1.4	.3	86/06/23	86/06/26
					TOT	355	3.712400	315.0400	17.74900	145.0	.08	86/04/01	86/10/22
00094	CNDUCTVY	FIELD	MICROMHO	WATER		355	137.9900	4559.300	67.52200	325	19	86/04/01	86/10/22
00300	OO		MG/L	WATER		304	10.35500	1.822000	1.349800	13.6	5.0	86/04/01	86/10/22
00400	PH		SU	WATER		316	7.331800	.1777200	.4215600	8.50	4.70	86/04/01	86/10/22
00665	PHOS-TOT		MG/L P	WATER		125	.0213780	.0051024	.0714310	.701	.001	86/04/18	86/09/09
31616	FEC COLI	MFM-FCBR	/100ML	WATER		21	14.00000	823.9000	28.70400	104	1	86/04/14	86/09/11
					K	23	1.000000	.0000000	.0000000	1	1	86/04/17	86/08/26
					TOT	44	7.204600	426.3500	20.64800	104	1	86/04/14	86/09/11
31673	FECSTREP	MFKFAGAR	/100ML	WATER		24	16.45800	608.0900	24.65900	78	1	86/05/06	86/09/11
					K	20	1.000000	.0000000	.0000000	1	1	86/04/14	86/08/26
					TOT	44	9.431800	385.8800	19.64400	78	1	86/04/14	86/09/11
74041	WQF	SAMPLE	UPDATED	WATER		383	861010.0	2810900	1676.600	861029	861002	86/04/01	86/10/22
80154	SUSP SED	CONC	MG/L	WATER		313	28.55100	33392.00	182.7300	2279	0	86/04/01	86/09/10
					K	12	.3108300	.0028812	.0536770	.4	.3	86/06/11	86/09/10
					TOT	325	27.50900	32184.00	179.4000	2279	0	86/04/01	86/09/10
80225	BEDLOAD	DISCHARG	TONS/DAY	WATER		70	4.652700	487.6900	22.08400	176.89	.00	86/04/24	86/09/03
					J	4	.2000000	.1600000	.4000000	.80	.00	86/05/02	86/06/25
					TOT	74	4.412000	462.0000	21.49400	176.89	.00	86/04/24	86/09/03

Table A.II.4 1974-1986 Inventory--Flathead National Forest

84 TOTAL STATIONS PROCESSED

PARAMETER				MEDIUM	RMK	NUMBER	MEAN	VARIANCE	STAN DEV	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010	WATER	TEMP	CENT	WATER		591	7.145000	9.332400	3.054900	18.0	.0	74/09/11	86/05/21
					D	298	6.506000	9.589800	3.096700	15.0	.0	77/11/08	79/10/03
					K	1	8.000000			8.0	8.0	79/09/12	79/09/12
					TOT	890	6.932000	9.489700	3.080500	18.0	.0	74/09/11	86/05/21
00011	WATER	TEMP	FAHN	WATER		1649	44.06800	61.79900	6.465200	74.0	31.0	74/08/05	86/10/22
00020	AIR	TEMP	CENT	WATER		666	13.56400	41.00700	6.403700	37.5	.0	74/08/05	86/05/21
					D	13	13.30500	45.04000	6.711800	28.0	4.0	79/06/08	79/10/03
					M	4	-4.75000	17.58300	4.193300	-2.0	-11.0	77/11/08	78/10/19
					TOT	665	13.45100	42.85900	6.546700	37.5	-11.0	74/08/05	86/05/21
00021	AIR	TEMP	FAHN	WATER		1680	57.16800	146.2000	12.09100	95.0	5.5	74/08/05	86/10/22
00055	STREAM	VELOCITY	FT/SEC	WATER		1959	1.745100	1.662500	1.297100	9.6	.005	74/08/05	86/10/22
					J	12	1.442500	1.785900	1.336400	4.4	.1	80/07/07	81/09/14
					TOT	1971	1.743200	1.682800	1.297200	9.6	.005	74/08/05	86/10/22
00060	STREAM	FLOW	CFS	WATER		2329	53.57500	19069.00	138.6100	1200	.005	74/08/05	86/10/22
					D	6	8.575000	132.0500	11.49100	26	2	79/04/20	79/09/07
					J	428	56.43500	23790.00	154.2400	1500	.01	74/08/05	86/09/08
					K	10	.9100000	.0810000	.2846100	1	.1	76/08/05	78/09/12
					TOT	2771	53.76200	15506.00	124.5200	1500	.005	74/08/05	86/10/22
00065	STREAM	STAGE	FEET	WATER		1253	1.218100	.6550000	.8093200	5.80	.01	75/05/08	86/10/22
					J	7	.6357100	.4301600	.6619400	1.09	.02	82/05/18	85/08/08
					TOT	1260	1.214900	.6553200	.8095200	5.80	.01	75/05/08	86/10/22
00076	TURB	TRBIDMTR	HACH FTU	WATER		1911	4.428300	822.2200	28.67500	520.0	.0	74/08/05	86/10/22
					D	40	1.375200	3.422800	1.850100	9.0	.009	80/06/03	80/07/21
					K	3	200.1200	119930.0	346.3000	600.0	.2	74/08/05	80/06/29
					L	15	.5386700	.0811700	.2849000	1.4	.3	86/06/23	86/06/26
					TOT	1959	4.634800	978.5600	31.26200	600.0	.0	74/08/05	86/10/22
00080	COLOR	PT-CO	UNITS	WATER		360	10.10000	151.3400	12.30200	59	.0	74/08/05	86/09/14
00094	CNDUCTVY	FIELD	MICROMHO	WATER		2054	148.5200	7649.200	87.46000	482	19	74/08/20	86/10/22
					D	277	163.5300	3938.500	62.75700	370	12	77/11/08	80/07/07
					TOT	2331	150.3000	7230.000	85.02900	482	12	74/08/20	86/10/22
00095	CNDUCTVY	AT 25C	MICROMHO	WATER		875	169.7900	6914.400	83.15300	469	19	76/06/13	83/08/18
00300	DO		MG/L	WATER		1486	9.626100	1.262000	1.123400	13.6	.9	74/08/05	86/10/22
					D	8	9.012500	.5756100	.7586900	9.8	7.5	80/06/21	80/07/07
					TOT	1494	9.622800	1.260000	1.122500	13.6	.9	74/08/05	86/10/22
00301	DO	SATUR	PERCENT	WATER		6	75.83300	12.83700	3.582800	79.2	68.9	74/09/11	81/09/11
00400	PH		SU	WATER		1632	7.397000	.1854700	.4306600	9.70	4.70	77/04/08	86/10/22
					D	330	7.541000	.1429800	.3781200	8.50	6.20	77/11/08	80/07/07
					J	1	7.200000			7.20	7.20	85/09/12	85/09/12
					K	6	6.500000	.0000000	.0000000	6.50	6.50	80/05/13	81/07/14
					Z	1	7.500000			7.50	7.50	79/09/06	79/09/06
					TOT	1970	7.418300	.1829900	.4277800	9.70	4.70	77/04/08	86/10/22
00403	LAB	PH	SU	WATER		1063	7.831600	.2423600	.4923100	8.6	6.1	74/08/05	83/08/18
00410	T ALK	CACO3	MG/L	WATER		844	89.34800	2526.600	50.26500	218	4	74/08/05	83/08/18
					D	121	96.22800	2593.800	50.92900	204	10	77/11/29	81/08/17

Table A.II.4 1974-1986 Inventory--Flathead National Forest
(Continued)

84 TOTAL STATIONS PROCESSED

PARAMETER			MEDIUM	RMK	NUMBER	MEAN	VARIANCE	STAN DEV	MAXIMUM	MINIMUM	BEG DATE	END DATE
00410 T ALK	CACO3	MG/L	WATER	TOT	965	90.21000	2537.500	50.37400	218	4	74/08/05	83/08/18
00440 HCO3 ION	HCO3	MG/L	WATER		719	106.1300	3095.700	55.63900	254	6	74/08/05	83/08/18
				D	1	74.00000			74	74	79/05/03	79/05/03
				TOT	720	106.0800	3092.900	55.61300	254	6	74/08/05	83/08/18
00445 CO3 ION	CO3	MG/L	WATER		526	.2971500	1.293300	1.137200	10	0	76/06/13	83/08/18
				J	2	.0000000	.0000000	.0000000	0	0	79/10/03	79/10/03
				K	1	.1000000			.1	.1	79/10/03	79/10/03
				U	180	.0000000	.0000000	.0000000	0	0	77/11/08	79/08/29
				V	1	.0000000			0	0	78/05/16	78/05/16
				TOT	710	.2202800	.9745900	.9872200	10	0	76/06/13	83/08/18
00618 NO3-N	DISS	MG/L	WATER		773	.1203900	.0648010	.2545600	3.73	.00	76/06/13	83/08/18
				K	45	.0134450	.0001911	.0138260	.10	.01	76/06/13	81/08/25
				TOT	818	.1145100	.0618370	.2486700	3.73	.00	76/06/13	83/08/18
00620 NO3-N	TOTAL	MG/L	WATER		312	.1191100	.0739270	.2719000	4.000	.000	75/06/24	81/05/15
				K	165	.0635390	.0017174	.0414410	.300	.023	75/07/16	79/10/03
				TOT	477	.0998890	.0495930	.2227000	4.000	.000	75/06/24	81/05/15
00660 ORTHOPO4	PO4	MG/L	WATER		91	.0038462	.0000291	.0053974	.03	.001	75/06/24	77/09/29
				K	206	.0266360	.0000871	.0093343	.03	.001	74/08/05	77/09/29
				TOT	297	.0196530	.0001799	.0134150	.03	.001	74/08/05	77/09/29
00665 PHOS-TOT		MG/L P	WATER		711	.0576680	.0130320	.1141600	1.418	.000	76/07/21	86/09/09
				D	1	.0490000			.049	.049	78/05/19	78/05/19
				K	84	.0088214	.0000055	.0092517	.070	.001	76/07/23	81/08/20
				TOT	796	.0525020	.0118730	.1089600	1.418	.000	76/07/21	86/09/09
00666 PHOS-DIS		MG/L P	WATER		305	.0227610	.0013123	.0362250	.367	.001	76/06/13	80/09/23
				K	102	.0056961	.0000088	.0029678	.010	.001	76/06/13	80/09/18
				TOT	487	.0191870	.0010870	.0329700	.367	.001	76/06/13	80/09/23
00671 PHOS-DIS	ORTHO	MG/L P	WATER		1	.0333000			.033	.033	78/06/23	78/06/23
				K	3	.0070000	.0000000	.0000000	.007	.007	80/06/13	80/06/20
				TOT	4	.0135750	.0001729	.0131500	.033	.007	78/06/23	80/06/20
00680 T ORG C	C	MG/L	WATER		96	4.578000	15.73000	3.967100	19.2	.5	81/05/11	81/09/23
00900 TOT HARD	CACO3	MG/L	WATER		696	88.58900	2259.100	47.53000	203	4	75/04/24	83/08/18
				D	167	93.62300	2104.900	45.88000	200	10	77/04/14	81/08/17
				TOT	865	89.56000	2230.800	47.23200	203	4	75/04/24	83/08/18
00915 CALCIUM	CA,DISS	MG/L	WATER		834	25.49400	220.7700	14.85900	61.0	1.1	75/04/24	83/08/18
00925 MGNSIUM	MG,DISS	MG/L	WATER		826	6.416600	14.94900	3.866400	29.6	.2	75/04/24	83/08/18
00930 SODIUM	NA,DISS	MG/L	WATER		831	1.269600	.5347000	.7312300	4.20	.09	75/04/24	83/08/18
				K	1	.1000000			.10	.10	80/05/13	80/05/13
				TOT	832	1.268200	.5357100	.7319200	4.20	.09	75/04/24	83/08/18
00935 PTSSIUM	K,DISS	MG/L	WATER		762	.6919100	.1022200	.4272800	3.10	.00	76/05/06	83/08/15
				.	1	.9000000			.90	.90	78/06/20	78/06/20
				K	27	.1000000	.0000000	.0000000	.10	.10	80/06/13	83/08/18
				TOT	790	.5051400	.1847800	.4298700	3.10	.00	76/05/06	83/08/18
00940 CHLORIDE	TOTAL	MG/L	WATER		810	.6232860	.7814600	.8839900	15	0	75/04/24	83/08/18
				K	22	.0877273	.0009993	.0316130	.1	.01	79/08/27	83/05/13

Table A.II.4 1974-1986 Inventory--Flathead National Forest
(Continued)

84 TOTAL STATIONS PROCESSED

PARAMETER			MEDIUM	RMK	NUMBER	MEAN	VARIANCE	STAN DEV	MAXIMUM	MINIMUM	BEG DATE	END DATE
00940 CHLORIDE	TOTAL	MG/L	WATER	U	1	.0000000			0	0	78/09/13	78/09/13
00940 CHLORIDE	TOTAL	MG/L	WATER	TOT	833	.6083800	.7676900	.8761800	15	0	75/04/24	83/08/18
00945 SULFATE	SO4-TOT	MG/L	WATER		823	3.568200	49.37600	7.026800	87	0	75/04/24	83/08/18
				K	1	.1000000			.1	.1	79/09/12	79/09/12
				U	1	.0000000			0	0	78/08/20	78/08/20
				TOT	825	3.559700	49.28600	7.020400	87	0	75/04/24	83/08/18
00950 FLUORIDE	F,DISS	MG/L	WATER		362	.0810270	.0137020	.1170600	1.30	.00	75/04/24	83/08/18
				K	263	.0946380	.0003616	.0190180	.10	.01	75/04/24	82/06/25
				TOT	625	.0867550	.0081242	.0901350	1.30	.00	75/04/24	83/08/18
00955 SILICA	DISOLVED	MG/L	WATER		605	7.469100	15.10600	3.886700	19.2	.2	77/04/08	83/08/18
01000 ARSENIC	AS,DISS	UG/L	WATER		1	1.000000			1	1	75/04/24	75/04/24
				K	5	1.000000	.0000000	.0000000	1	1	75/04/24	75/04/24
				TOT	6	1.000000	.0000000	.0000000	1	1	75/04/24	75/04/24
01025 CADMIUM	CD,DISS	UG/L	WATER	K	7	1.000000	.0000000	.0000000	1	1	75/04/24	75/04/24
01040 COPPER	CU,DISS	UG/L	WATER		11	22.54600	418.8700	20.46600	57	4	80/05/12	81/06/25
				K	15	10.66700	6.666700	2.582000	20	10	75/04/24	80/06/20
				TOT	26	15.69200	207.1000	14.39100	57	4	75/04/24	81/06/25
01042 COPPER	CU,TOT	UG/L	WATER		16	6.188200	14.02000	3.744400	12	.01	81/05/05	81/09/11
				K	35	6.400000	15.95300	3.994100	10	.2	81/05/06	81/10/06
				TOT	51	6.333600	15.06400	3.881200	12	.01	81/05/05	81/10/06
01046 IRON	FE,DISS	UG/L	WATER		419	50.31000	8552.400	92.47900	1350	2	75/04/24	83/08/15
				K	196	9.489000	31.32800	5.597200	40	2	75/04/24	83/08/18
				TOT	615	37.30100	6194.700	78.70600	1350	2	75/04/24	83/08/18
01049 LEAD	PB,DISS	UG/L	WATER		2	85.00000	2450.000	49.49800	120	50	80/05/22	80/05/23
				K	10	47.00000	23.33300	4.830500	50	40	75/04/24	80/05/27
				TOT	12	53.33300	460.6100	21.46200	120	40	75/04/24	80/05/27
01056 MANGNESE	MN,DISS	UG/L	WATER		106	5.990600	49.80000	7.056900	60.0	1.0	75/04/24	83/08/15
				D	2	10.00000	.0000000	.0000000	10.0	10.0	77/06/16	80/07/21
				K	508	9.381900	5.175500	2.275000	10.0	1.0	75/04/24	83/08/18
				TOT	616	8.800300	14.41400	3.796600	60.0	1.0	75/04/24	83/08/18
01065 NICKEL	NI,DISS	UG/L	WATER	K	6	20.00000	.0000000	.0000000	20	20	75/04/24	75/04/24
01005 VANADIUM	V,DISS	UG/L	WATER	K	1	10.00000			10	10	80/06/13	80/06/13
01090 ZINC	ZN,DISS	UG/L	WATER		10	37.10000	5199.900	72.11000	240	4	80/05/12	81/06/25
				K	10	10.00000	.0000000	.0000000	10	10	75/04/24	81/05/14
				TOT	20	23.55000	2656.400	51.54000	240	4	75/04/24	81/06/25
01092 ZINC	ZN,TOT	UG/L	WATER		18	16.38900	166.8400	12.91700	42	1	81/05/06	81/10/06
				D	1	10.00000			10	10	81/06/25	81/06/25
				K	32	6.437800	12.18500	3.490800	10	.01	81/05/05	81/10/06
				TOT	51	10.02000	87.09600	9.332500	42	.01	81/05/05	81/10/06
31616 FEC COLI	MFM-FCBR	/100ML	WATER		416	5.657000	600.8100	24.51200	344	0	74/08/08	86/09/11
				K	77	1.000000	.0000000	.0000000	1	1	80/04/29	86/08/26
				TOT	493	4.929600	509.6500	22.57500	344	0	74/08/05	86/09/11
31673 FECSTREP	MFKFAGAR	/100ML	WATER		161	28.34000	2738.700	52.33300	380	1	80/04/23	86/09/11
				K	44	1.000000	.0000000	.0000000	1	1	80/05/05	86/08/26

Table A.II.4 1974-1986 Inventory--Flathead National Forest
(Continued)

84 TOTAL STATIONS PROCESSED

PARAMETER				MEDIUM	RMK	NUMBER	MEAN	VARIANCE	STAN DEV	MAXIMUM	MINIMUM	BEG DATE	END DATE
31673 FECSTREP	MFKFAGAR	/100ML		WATER	TOT	205	22.47200	2274.600	47.69300	380	1	80/04/23	86/09/11
70300 RESIDUE	DISS-180 C	MG/L		WATER		277	121.8100	2017.000	44.91000	225	18	77/04/08	79/10/03
70301 DISS SOL	SUM	MG/L		WATER		688	148.4600	5210.200	72.18200	352	12	76/06/13	83/08/18
71850 NITRATE	TOT-NO3	MG/L		WATER		6	.0560000	.0006204	.0249080	.1	.03	74/08/05	75/06/24
					K	147	.0300000	.0000000	.0000000	.03	.03	74/08/05	75/06/24
					TOT	153	.0310200	.0000460	.0067857	.1	.03	74/08/05	75/06/24
71890 MERCURY	HG,DISS	UG/L		WATER		1	.0300000			.03	.03	80/05/23	80/05/23
					K	12	.1291700	.0076629	.0875380	.2	.03	75/04/24	80/05/27
					TOT	13	.1215400	.0077806	.0882090	.2	.03	75/04/24	80/05/27
74041 WQF	SAMPLE	UPDATED		WATER		384	861010.0	2803500	1674.400	861029	861002	85/08/13	86/10/22
80154 SUSP SED	CONC	MG/L		WATER		2343	27.87400	383290.0	619.1000	29370	0	74/08/05	86/09/10
					K	69	.6479700	.1493200	.3864200	1	.03	76/05/24	86/09/10
					TOT	2412	27.09500	372348.0	610.2000	29370	0	74/08/05	86/09/10
80225 BEDLOAD	DISCHARG	TONS/DAY		WATER		389	.9311600	90.19300	9.497000	176.89	.00	76/05/06	86/09/03
					J	4	.2000000	.1600000	.4000000	.80	.00	86/05/02	86/06/25
					K	18	.0112250	9039E-13	.0000300	.01	.01	76/05/06	78/09/12
					O	1	.0000000			.00	.00	79/09/05	79/09/05
					U	126	.0000000	.0000000	.0000000	.00	.00	77/11/08	79/08/29
					TOT	538	.6751400	65.34000	8.083300	176.89	.00	76/05/06	86/09/03

Table A.II.5

Estimating Mean Daily Loads by Month by Pooling Data for Period of Record, Lower Whale Creek--Flathead National Forest

FL7002
48 52 16.0 114 28 01.0 3
WHALE C, LOWER 36 MI. NW COLUMBIA FALLS, MT.
30029 MONTANA FLATHEAD
PACIFIC NORTHWEST 130200
CLARK FORK-PEND OREILLE RIVER
113FORS1 801101 17010206 HQ
0000 FEET DEPTH

INDEX
MILES

DATE FROM TO	00060 STREAM FLOW CFS	80154 TSS LOAD LB/D	80154 TSS TONS	70301 DISS SOL SUM MG/L	70301 SDS LOAD LB/D	70301 SDS TONS LB/D	80225 BEDLOAD DISCHARGE TONS/DAY	00076 TURB TURBIMTR HACH FTU	00094 CNDUCTVY FIELD MICROMHO
84/05/08 1000	109.200	647.899	.323950					.480000	227.000
84/05/11 1000	120.000	1359.23	.679615					.560000	221.000
80/05/23 1330	177.900	7388.55	3.69427	123.700	118697	59.3482			112.000
86/05/12 1030	218.370	2237.89	1.11894					.800000	194.000
86/05/20 1315	225.000	849.519	.424759					1.60000	92.0000
84/05/15 1000	245.000	4493.01	2.24650					2.60000	185.000
81/05/12 1400	246.700	625.402	.312701						230.000
86/05/06 1030	264.530	2568.26	1.28413					.900000	184.000
85/05/13 1000	324.600	13831.5	6.91572					1.10000	187.700
84/05/29 1100	324.800	7007.58	3.50379					1.60000	178.000
84/05/24 1015	325.000	5960.11	2.98006					.660000	175.100
85/05/06 1050	339.600	9524.96	4.76248					1.20000	164.700
86/05/23 1030	401.240	17530.0	8.76499				1.62000	.500000	168.000
78/05/24 1100	415.800	19736.0	9.86800	127.700	286396	143.198	.0000000		200.000
79/05/15 1100	474.000	10226.6	5.11329				.0000000		160.000
86/05/27 1230	703.390	135822	67.9112				3.24000	2.50000	138.000
83/05/27 1000	805.300	70800.6	35.4003					1.45000	131.000
85/05/10 1100	997.200	26355.5	13.1777					2.20000	136.200
85/05/20 1000	1189.00	208429	104.214					1.60000	180.200
97/05/01									
MONTH PCTL(010.0)	120.000	647.899	.323950	123.700	118697	59.3482	.0000000	.480000	112.000
PCTL(050.0)	324.800	7388.55	3.69427	123.700	118697	59.3482	.0000000	1.20000	178.000
PCTL(090.0)	997.200	135822	67.9112	127.700	286396	143.198	3.24000	2.50000	227.000
NUMBER	19	19	19	2	2	2	4	15	19
MAXIMUM	1189.00	208429	104.214	127.700	286396	143.198	3.24000	2.60000	230.000
MINIMUM	109.200	625.402	.312701	123.700	118697	59.3482	.0000000	.480000	92.0000
SUM	7906.62	545394	272.697	251.400	405093	202.546	4.86000	19.7500	3263.90
SUM-SQUAR	.4888E+07	.6885E+11	17213.8	31609.0	.9611E+11	24027.9	13.1220	32.9621	585748
MEAN	416.138	28704.9	14.3524	125.700	202546	101.273	1.21500	1.31667	171.784
FLOW-WT.AV	618.331	58538.6	29.2693	126.501	236146	118.073	1.46859	1.55504	163.871
VARIANCE	88814.7	.2955E+10	738.887	8.00000	.1406E+11	3515.40	2.40570	.496996	1392.31
STAND DEV	298.018	54364.9	27.1825	2.82843	118582	59.2908	1.55103	.704980	37.3136
COEF VAR	.716152	1.89392	1.89393	.0225614	.585454	.585454	1.27657	.535428	.217212
STAND ERR	60.3700	12472.2	6.23609	2.00000	83849.8	41.9249	.775516	.182025	8.56033
97/05/31									

Table A.II.5
(Continued)

Estimating Mean Daily Loads by Month by Pooling Data for Period of Record, Lower Whale Creek--Flathead National Forest

FL7002
48 52 16.0 114 28 01.0 3
WHALE C, LOWER 36 MI. NNW COLUMBIA FALLS, MT.
30029 MONTANA FLATHEAD
PACIFIC NORTHWEST 130200
CLARK FORK-PEND OREILLE RIVER
113FORS1 8C1101 17010206 HQ
0000 FEET DEPTH

INDEX
MILES

DATE FROM TO	00060 STREAM FLOW CFS	80154 TSS LOAD LB/D	80154 TSS TONS LB/D	70301 DISS SOL SUM MG/L	70301 SDS LOAD LB/D	70301 SDS TONS LB/D	80225 BEDLOAD DISCHARG TONS/DAY	00076 TURB TRBIDMTR HACH FTU	00094 CNDUCTVY FIELD MICROMHO
86/06/30 1004	171.040	1577.56	.788780				.0000000	.650000	218.000
86/06/23	199.450	1355.49	.677746				.0000000	.710000	207.000
78/06/30 1000	266.500	4743.55	2.37177	120.000	172493	86.2463	.0000000		141.000
80/06/19 1200	285.900	6014.10	3.00705	154.000	237480	118.740			186.000
83/06/23 0930	286.300	5095.97	2.54799					.660000	179.000
85/06/24 1030	294.900	4771.87	2.38593					1.25000	202.100
83/06/30 1000	304.200	4758.27	2.37914	144.100	236437	118.218		.960000	164.600
86/06/16 1030	327.200	5437.03	2.71852				.120000	.270000	172.000
84/06/04 1000	386.000	7495.18	3.74759					.940000	157.100
84/06/11 1015	391.900	5707.31	2.85365					.930000	166.000
83/06/14 1030	447.100	19774.7	9.88737					.750000	160.000
86/06/09 0930	492.670	13286.7	6.64337				.200000	.330000	155.000
79/06/08 1000	497.020	5361.62	2.68081						120.000
84/06/25 1000	518.800	25744.2	12.8721					.690000	155.000
84/06/18 1000	551.000	16643.0	8.32151					1.20000	144.000
83/06/09 1030	573.400	16391.8	8.19588					.450000	146.000
78/06/09 1300	585.200	98796.3	49.3981	108.600	342789	171.394	.0000000		141.000
83/06/02 1030	609.500	23012.5	11.5063	122.900	404034	202.017		.900000	143.000
85/06/10 1300	719.700	65215.8	32.6079					2.35000	139.100
86/06/02	764.760	403419	201.709				.570000	8.00000	141.000
97/06/01									
MONTH PCTL(010.0)	199.450	1577.56	.788780	108.600	172493	86.2463	.0000000	.270000	139.100
PCTL(050.0)	391.900	6014.10	3.00705	122.900	237480	118.740	.0000000	.750000	155.000
PCTL(090.0)	609.500	65215.8	32.6079	154.000	404034	202.017	.570000	2.35000	202.100
NUMBER	20	20	20	5	5	5	7	16	20
MAXIMUM	764.760	403419	201.709	154.000	404034	202.017	.570000	8.00000	218.000
MINIMUM	171.040	1355.49	.677746	108.600	172493	86.2463	.0000000	.270000	120.000
SUM	8672.61	734602	367.301	649.600	.1393E+07	696.616	.890000	21.0400	3236.90
SUM-SQUAR	.4300E+07	.1793E+12	44836.9	85779.1	.4228E+12	105700	.379300	78.7902	536311
MEAN	433.630	36730.1	18.3650	129.920	278646	139.323	.127143	1.31500	161.845
FLOW-WT.AV	475.920	56732.6	28.3663	125.922	388413	194.208	.206305	1.72229	154.409
VARIANCE	28432.5	.8019E+10	2004.81	345.812	.8645E+10	2161.36	.0443571	3.40817	654.460
STAND DEV	168.619	89550.1	44.7751	18.5960	92980.9	46.4904	.210611	1.84612	25.5824
COEF VAR	.388855	2.43806	2.43806	.143135	.333688	.333688	1.65649	1.40390	.158067
STAND ERR	37.7044	20024.0	10.0120	8.31640	41582.3	20.7911	.0796036	.461531	5.72040

97/06/30

SEDIMENT VS DISCHARGE

WHALE CREEK

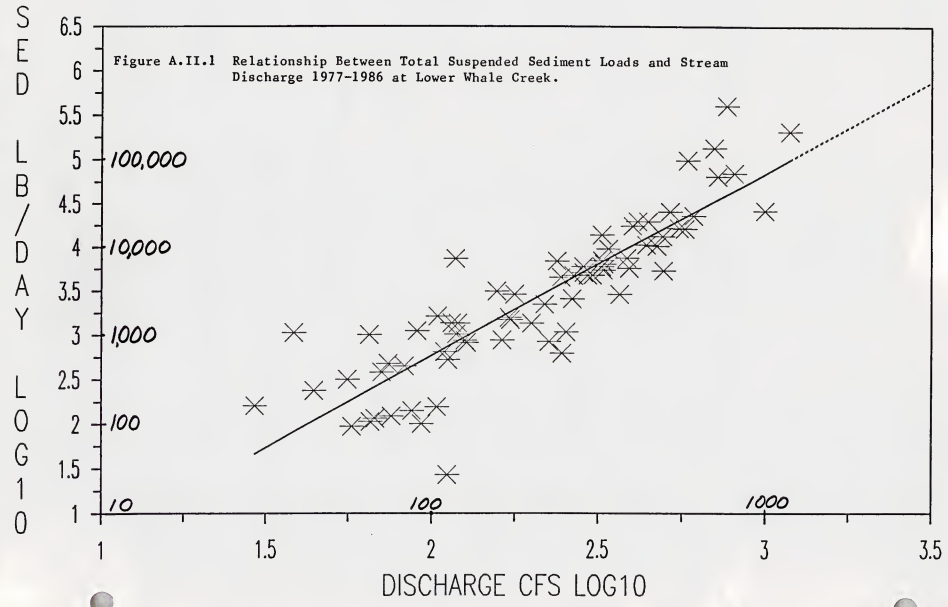


Figure A.II.1 Relationship Between Total Suspended Sediment Loads and Stream Discharge 1977-1986 at Lower Whale Creek.

PHOSPHORUS VS DISCHARGE

WHALE CREEK - 1986

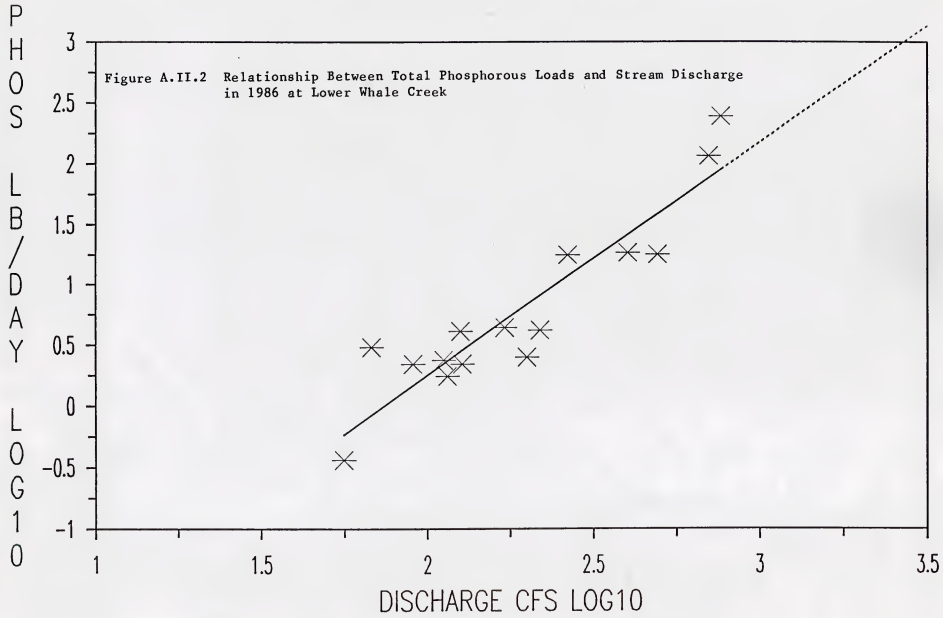


Figure A.II.2 Relationship Between Total Phosphorous Loads and Stream Discharge in 1986 at Lower Whale Creek

PHOSPHORUS VS SEDIMENT

WHALE CREEK 1986

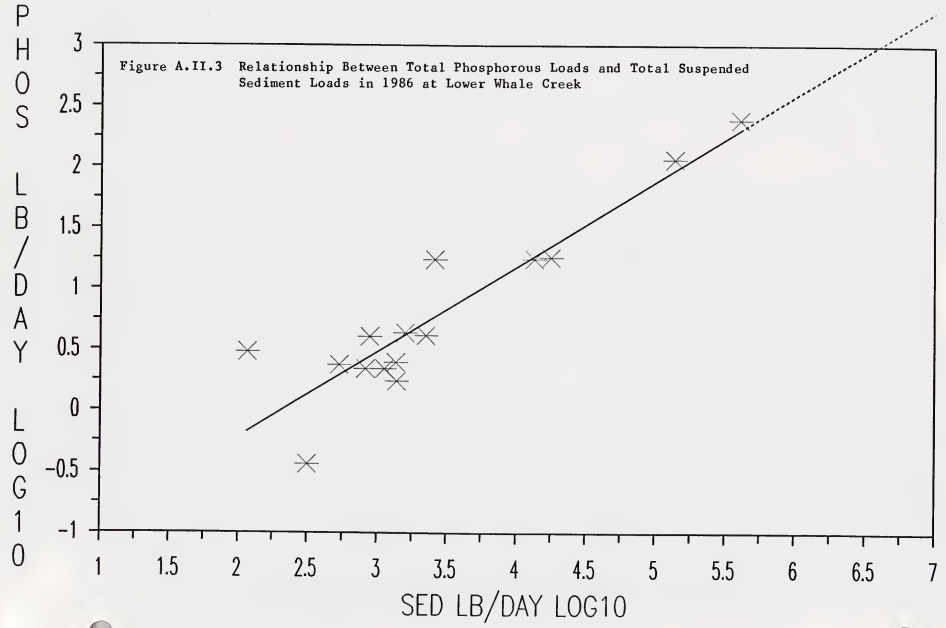


Figure A.II.3 Relationship Between Total Phosphorous Loads and Total Suspended Sediment Loads in 1986 at Lower Whale Creek

PHOSPHORUS VS DISCHARGE

WHALE CREEK 1986

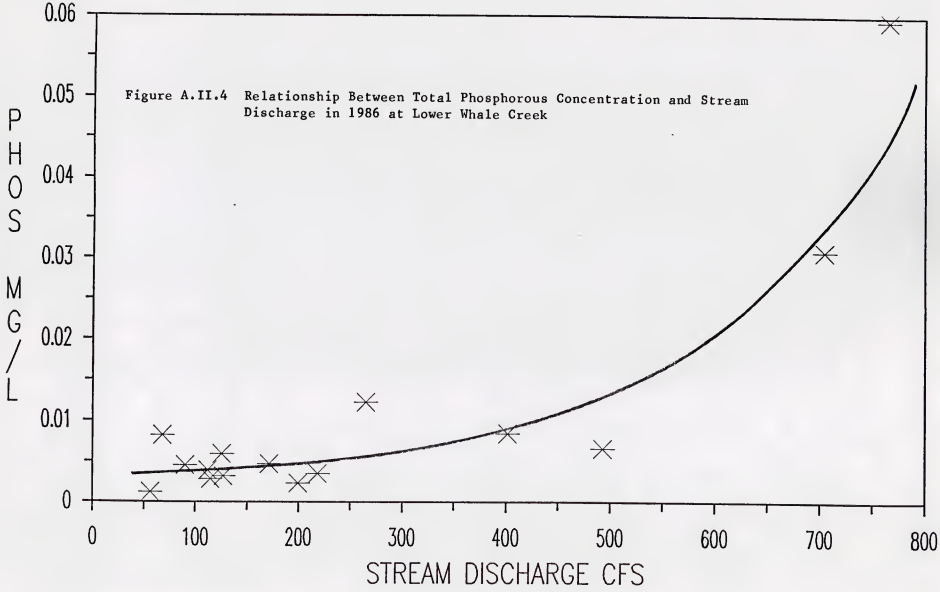


Figure A.II.4 Relationship Between Total Phosphorous Concentration and Stream Discharge in 1986 at Lower Whale Creek

PHOSPHORUS VS DISCHARGE

WHALE CREEK 1986

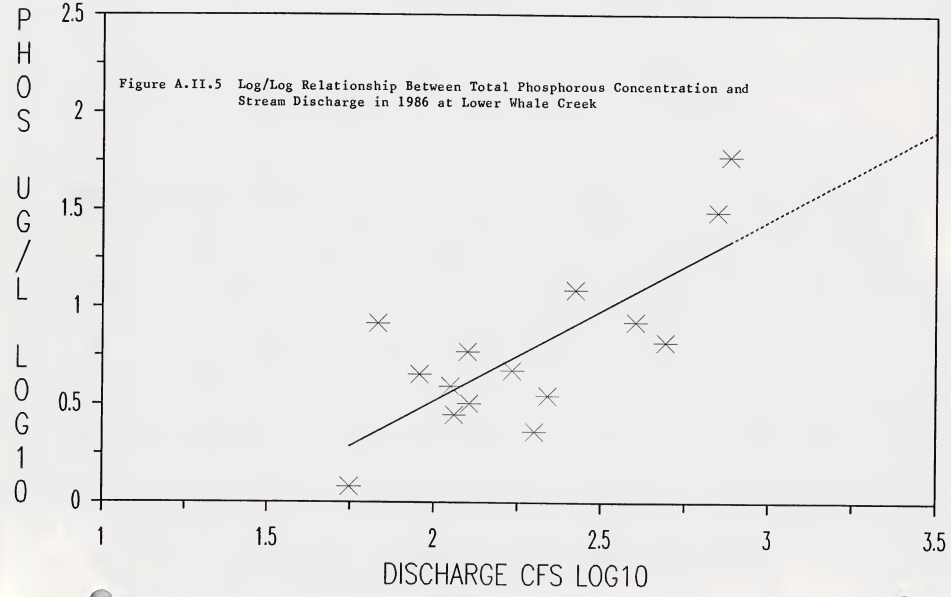
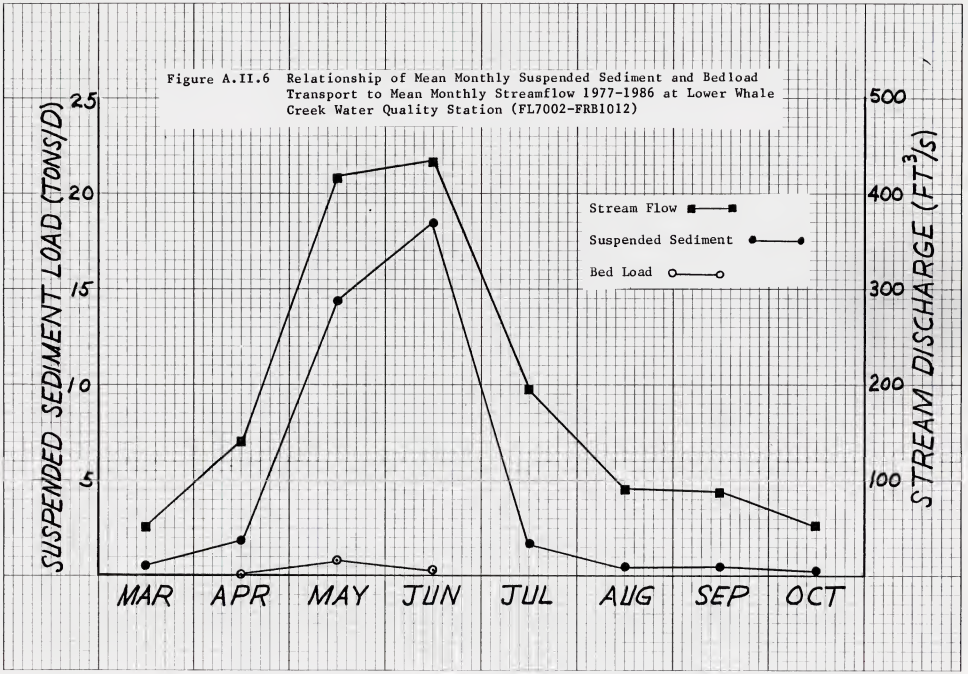


Figure A.II.5 Log/Log Relationship Between Total Phosphorous Concentration and Stream Discharge in 1986 at Lower Whale Creek

Figure A.II.6 Relationship of Mean Monthly Suspended Sediment and Bedload Transport to Mean Monthly Streamflow 1977-1986 at Lower Whale Creek Water Quality Station (FL7002-FRB1012)



FL7002
48 52 16.0 114 28 01.0 3
WHALE C. LOWER 36 MI. NNW COLUMBIA FALLS, MT.
30029 MONTANA FLATHEAD
PACIFIC NORTHWEST 130200
CLARK FORK-PEND OREILLE RIVER
113FORS1 801101 17010206 HG
0000 FEET DEPTH

/TYPA/AMBNT/STREAM

INDEX
MILES

Table A.II.6 1986 Data Listing by Station--Flathead National Forest

DATE FROM TO	TIME OF DAY	MEDIUM	SMK OR DEPTH (FT)	00065 STREAM STAGE FEET	00055 STREAM VELOCITY FT/SEC	00060 STREAM FLOW CFS	00076 TURB TRBIDMTR HACH FTU	80154 SUSP SED CONC MG/L	80225 BEDLOAD DISCHARG TONS/DAY	00665 PHOS-TOT MG/L P	00300 DO MG/L	00400 PH SU	00094 CNDUCTVY FIELD MICROMHO
86/01/21	1430	WATER		.58	1.9	127	2.5	1		.003	10.0	7.30	223
86/05/06	1030	WATER		1.12	3.0	265	.9	2		.012	10.6	7.30	184
86/05/12	1030	WATER		.99	2.6	218	.8	2		.004	10.8	7.30	194
86/05/20	1315	WATER		1.11		225J	1.6	.7					92
86/05/23	1030	WATER		1.40	4.0	401	.5	8	1.62	.008	10.8	7.30	168
86/05/27	1230	WATER		1.90	5.4	703	2.5	36	3.24	.031	13.6	7.30	138
86/06/02		WATER			6.0	765	8.0	98	.57	.060	11.4	7.30	141
86/06/09	0930	WATER		1.54	4.6	493	.3	5	.20	.007	11.4	7.40	159
86/06/16	1030	WATER		1.15	3.5	327	.3	3	.12		10.6	7.30	172
86/06/23		WATER		.87	2.7	199	.7L	1	.00	.002		7.50	207
86/06/30	1004	WATER			2.5	171	.7	2	.00	.005	9.6	7.70	218
86/07/10	0935	WATER		.52	3.0	126	.2	1	.00	.006	10.4	7.50	242
86/07/17	1000	WATER		.53	2.6	115	.3	2	.00	.003	10.0	7.40	246
86/07/24	1125	WATER		.42	2.7	112	.4	.9	.00	.004	11.6	7.60	253
86/08/04	1000	WATER			2.4	90	.5	2	.00	.005	9.4	7.70	177
86/08/19	0940	WATER		.24	2.1	68	.5	3	.00	.008	10.2	7.60	194
86/09/03	0945	WATER		.18	1.9	56	.7	1	.00	.001	9.4	7.40	311

FL7002
48 52 16.0 114 28 01.0 3
WHALE C, LOWER 36 MI. NNW COLUMBIA FALLS, MT.
30029 MONTANA FLATHEAD
PACIFIC NORTHWEST 130200
CLARK FORK-PEND OREILLE RIVER
113FORS1 801101 17010206 HQ
0000 FEET DEPTH

/TYPA/AM3NT/STREAM

INDEX
MILES

DATE FROM TO	TIME OF DAY	MEDIUM	SMK OR DEPTH (FT)	00011 WATER TEMP FAHN	00021 AIR TEMP FAHN	31616 FEC COLI MFM-FCBR /100ML	31673 FECSTREP MFKFAGAR /100ML
86/04/21	1430	WATER		41.0	61.0		
86/05/06	1030	WATER		36.0	50.0		
86/05/12	1030	WATER		35.0	40.0		
86/05/23	1030	WATER		38.0	50.0		
86/05/27	1230	WATER		44.0	74.0		
86/06/02		WATER		44.0	65.0		
86/06/09	0930	WATER		43.0	59.0		
86/04/16	1030	WATER		41.0	54.0		
86/06/23		WATER		48.0	80.0		
86/06/30	1004	WATER		42.0	48.0		
06/07/10	0935	WATER		45.0	54.0		
86/07/17	1030	WATER		40.0	43.0		
86/07/24	1125	WATER		48.0	52.0		
86/08/04	1000	WATER		46.0	55.0		
86/08/19	0940	WATER		43.0	50.0		
86/09/03	0945	WATER		43.0	50.0		

FL7009
48 40 29.0 114 20 30.0 2
NF COAL C B MI. SW POLEBRIDGE, MT
30029 MONTANA FLATHEAD
PACIFIC NORTHWEST 130200
CLARK FORK-PEND OREILLE
113FORS1 820724 17010206 HG
0000 FEET DEPTH

/TYPA/AMBNT/STREAM

INDEX
MILES

DATE FROM TO	TIME OF DAY	MEDIUM	SMK OR DEPTH (FT)	00065 STREAM STAGE FEET	00055 STREAM VELOCITY FT/SEC	00060 STREAM FLOW CFS	00076 TURB TRBIDMTR HACH FTU	80154 SUSP SED CONC MG/L	80225 BEDLOAD DISCHARG TONS/DAY	00665 PHOS-TOT MG/L P	00300 DO MG/L	00400 PH SU	00094 CNDUCTVY FIELD MICROMHO
86/04/22	1200	WATER		1.45	2.4	85	.4	6		.007	11.0	7.50	162
86/05/02	1030	WATER		1.29	1.9	56	.6	3				7.40	193
86/05/05	1100	WATER		1.78	2.9	169	1.0	1			10.6	7.30	147
86/05/13	1200	WATER		1.56	2.3	93		.3			11.0	7.50	
86/05/22	1300	WATER		2.00	4.1	229	1.3	10			11.0	7.70	122
86/05/28	1245	WATER		2.52	2.5	387	4.8	29			12.6	7.30	98
86/06/03	1105	WATER		2.22	3.9	224	.4	9			12.0	7.30	99
86/06/10	1045	WATER		1.73	3.5	162	.4	4			11.2	7.40	102
86/06/18	1200	WATER		1.42	2.3	76	.3	14	4.75		10.0	7.30	115
86/06/25	1300	WATER		1.21	2.2	55	.3L	.6	.00J		10.8	7.70	149
86/07/01	1233	WATER		1.10	1.9	52	.5	.4		.004	11.0	7.40	162
86/07/08	1110	WATER		1.03	1.7	37	.5	2			10.2	7.60	163
86/07/14	1015	WATER		.95	1.6	32	.3	.6			10.4	7.50	100
86/07/21	1120	WATER		.90	1.4	26	.5	1			10.0	7.40	164
86/08/06	1100	WATER		.70	1.4	16	.5	.3			9.6	7.70	192
86/08/20	1130	WATER		.62	1.3	13	.5	1			10.6	7.70	189
86/09/02	1115	WATER		.60	1.5	11	.6	.6			9.4	7.70	203

FL7009
48 40 29.0 114 20 30.0 2
NF COAL C B MI. SW POLEBRIDGE, MT
30029 MONTANA FLATHEAD
PACIFIC NORTHWEST 130200
CLARK FORK-PEND OREILLE
113FORS1 820724 17010205 HQ
0000 FEET DEPTH

/TYPA/AMBNT/STREAM

INDEX
MILES

DATE FROM TO	TIME OF DAY	MEDIUM	EMK CR DEPTH (FT)	00011 WATER TEMP FAHN	00021 AIR TEMP FAHN	31616 FEC COLI MFM-FCBR /100ML	31673 FECSTREP MFKFAGAR /100ML
86/04/22	1200	WATER		36.0	54.0		
86/05/02	1030	WATER		36.0	54.0		
86/05/05	1100	WATER		38.0	47.0		
86/05/13	1200	WATER		38.0	48.0		
86/05/22	1300	WATER		37.0	42.0		
86/05/28	1245	WATER		43.0	82.0		
86/06/03	1105	WATER		44.0	64.0		
86/06/10	1045	WATER		45.0	70.0		
86/06/18	1200	WATER		47.0	62.0		
86/06/25	1300	WATER		44.0	62.0		
86/07/01	1233	WATER		48.0	64.0		
86/07/08	1110	WATER		48.0	64.0		
86/07/14	1015	WATER		48.0	58.0		
86/07/21	1120	WATER		52.0	64.0		
86/08/06	1100	WATER		50.0	70.0		
86/08/20	1130	WATER		47.0	59.0		
86/09/02	1115	WATER		48.0	58.0		

FL7010
48 40 29 0 114 24 31 0 2
SF COAL C B MI. SW POLEBRIDGE, MT
30029 MONTANA FLATHEAD
PACIFIC NORTHWEST 130200
CLARK FORK-PEND OREILLE
113FORS1 831125 17010206 HQ
0000 FEET DEPTH

/TYPA/AMBNT/STREAM

INDEX
MILES

DATE FROM TO	TIME OF DAY	MEDIUM	SMK OR DEPTH (FT)	00065 STREAM STAGE FEET	00055 STREAM VELOCITY FT/SEC	00060 STREAM FLOW CFS	00076 TURB TRBIDMTR HACH FTU	80154 SUSP SED CONC MG/L	80225 BEDLOAD DISCHARG TONS/DAY	00665 PHOS-TOT MG/L P	00300 DO MG/L	00400 PH SU	00094 CNDUCTVY FIELD MICROMHO
86/05/09	1230	WATER		1.62	3.1	80	.4	.3			10.6	7.30	107
86/05/13	1000	WATER		1.50	3.3	72	2.5	.3			10.8	7.40	130
86/05/22	1130	WATER		2.20	4.0	163	.5	13			8.6	7.50	101
86/05/29	1046	WATER		2.80	5.1	306	1.6	13			12.4	7.30	80
86/06/03	0930	WATER		2.52	4.8	259	.5	5			11.0	7.20	73
86/06/10	0930	WATER		1.94	3.6	129	.3	1			11.0	7.30	47
86/06/18	1000	WATER		1.56	2.6	71	.5	4	.31		10.0	7.50	102
86/06/25	1030	WATER		1.24	2.1	39	.4L	.9	.00J		10.8	7.60	122
86/07/01	1032	WATER			2.2	37	.5	1.0		.004	12.8	7.40	149
86/07/08	0950	WATER		.99	1.6	20	.4	3			10.2	7.50	141
86/07/14	0915	WATER		.94	2.0	25	.3	2			11.2	7.50	144
86/07/21	1015	WATER		.89	1.8	21	.4	1			10.4	7.40	134
86/08/06	0945	WATER		.69	1.3	11	.4	.3			9.6	7.60	141
86/08/20	1015	WATER		.62	1.1	10	.4	.3			10.2	7.60	156
86/09/02	1000	WATER		.60	1.1	8	.5	.3K			9.6	7.60	155

PL7010
48 40 29.0 114 24 31.0 2
SF COAL C B MI. SW POLEBRIDGE, MT
30029 MONTANA FLATHEAD
PACIFIC NORTHWEST 130200
CLARK FORK-PEND OREILLE
113FORS1 831123 17010206 HQ
0000 FEET DEPTH

/TYPA/AM3NT/STREAM

INDEX
MILES

DATE FROM TO	TIME OF DAY	MEDIUM	SMK OR DEPTH (FT)	00011 WATER TEMP FAHN	00021 AIR TEMP FAHN	31616 FEC COLI MFM-FCBR /100ML	31673 FECSTREP MFKFAGAR /100ML
86/05/09	1230	WATER		38.0	65.0		
86/05/13	1000	WATER		36.0	45.0		
86/05/22	1130	WATER		36.0	39.0		
86/05/29	1046	WATER		38.0	82.0		
86/06/03	0930	WATER		42.0	55.0		
86/06/10	0930	WATER		42.0	63.0		
86/06/18	1000	WATER		43.0	61.0		
86/06/25	1030	WATER		45.0	68.0		
86/07/01	1032	WATER		44.0	55.0		
86/07/08	0950	WATER		46.0	60.0		
86/07/14	0915	WATER		44.0	58.0		
86/07/21	1015	WATER		47.0	67.0		
86/08/04	0945	WATER		47.0	58.0		
86/08/20	1015	WATER		44.0	56.0		
86/09/02	1000	WATER		46.0	52.0		

FL7011
48 40 28 0 114 18 58.0 2
COAL C 6 MI. SSW POLEBRIDGE MT
30029 MONTANA FLATHEAD
PACIFIC NORTHWEST 130200
CLARK FORK-PEND OREILLE
113FORS1 831125 17010206 HG
0000 FEET DEPTH

/TYPA/AMBNT/STREAM

INDEX
MILES .

DATE FROM TO	TIME OF DAY	MEDIUM	SMK OR DEPTH (FT)	00065 STREAM STAGE FEET	00055 STREAM VELOCITY FT/SEC	00060 STREAM FLOW CFS	00076 TURB TRBIDMTR HACH FTU	80154 SUSP SED CONC MG/L	80225 BEDLOAD DISCHARG TONS/DAY	00665 PHOS-TOT MG/L P	00300 DO MG/L	00400 PH SU	00094 CNDUCTVY FIELD MICROMHO
86/01/22	1400	WATER		1.35	3.1	166	.7	9		.011	11.0	7.40	149
86/05/02	1145	WATER		.97	2.9	104	.4	2	.80J			7.30	158
86/05/05	1400	WATER		1.84	3.3	225	.9	6		.005	10.2	7.30	130
86/05/13	1330	WATER		1.46	3.5	201	.3	3		.005	8.2	7.40	137
86/05/20	1505	WATER		1.75		285J	12.0	3					122
86/05/22	1430	WATER		2.35	4.9	434	1.0	19	1.01	.013	12.8	7.40	114
86/05/28	1400	WATER		3.41	6.3	734	7.3	56	12.34	.025	12.4	7.30	92
86/06/03	1330	WATER		2.82	5.3	560	.6	17	.75	.018	11.6	7.20	92
86/06/10	1245	WATER		1.79	4.4	293	.6	7	1.00	.007	11.4	7.40	104
86/06/18	1430	WATER		1.22	3.6	160	.4	5	1.10	.004	9.6	7.30	113
86/06/24	1400	WATER		.90	2.9	96	.3L	1	.00J		9.4	8.00	138
86/07/01		WATER		.75	2.6	77	.5	5	.00		10.6	7.30	148
86/07/08	1245	WATER		.61	2.3	56	.4	2	.00	.006	9.6	7.40	152
86/07/14	1200	WATER		.55	2.4	55	.3		.00	.003	9.8	7.50	86
86/07/21	1300	WATER		.49	2.2	51	.4	2	.00	.004	9.2	7.50	148
86/08/06	1230	WATER		.27	1.8	27	.4	.3	.00	.003	9.6	7.50	112
86/08/20	1300	WATER		.16	1.5	23	.3	1	.00	.003	9.0	7.60	160
86/09/02	1230	WATER		.20	1.4	19	.5	.7	.00	.002	8.8	7.50	165

FL7011
48 40 28 0 114 18 58 0 2
COAL C & MI. SSW POLEBRIDGE MT
30029 MONTANA FLATHEAD
PACIFIC NORTHWEST 130200
CLARK FORK-PEND OREILLE
113FORS1 831125 17010206 HQ
0000 FEET DEPTH

/TYPA/AM3NT/STREAM

INDEX
MILES

DATE FROM TO	TIME OF DAY	MEDIUM	SMK OR DEPTH (FT)	00011 WATER TEMP FAHN	00021 AIR TEMP FAHN	31616 FEC COLI MFM-FCBR /100ML	31673 FECSTREP MFKFAGAR /100ML
86/04/22	1400	WATER		37.0	55.0		
86/05/02	1145	WATER		37.0	54.0		
86/05/05	1400	WATER		38.0	50.0		
86/05/13	1330	WATER		38.0	43.0		
86/05/22	1430	WATER		38.0	44.0		
86/05/28	1400	WATER		46.0	80.0		
86/06/03	1330	WATER		47.0	68.0		
86/06/10	1245	WATER		47.0	62.0		
86/06/18	1430	WATER		44.0	70.0		
86/06/24	1400	WATER		53.0	80.0		
86/07/01		WATER		54.0	84.0		
86/07/08	1245	WATER		52.0	65.0		
86/07/14	1200	WATER		52.0	68.0		
86/07/21	1300	WATER		56.0	72.0		
86/08/06	1230	WATER		51.0	72.0		
86/08/20	1300	WATER		48.0	78.0		
86/09/02	1230	WATER		46.0	60.0		

/TYPA/AMBNT/STREAM

FL7012
48 35 51.0 114 13 24.0 3
BIG CR @ LOOKOUT BRIDGE
30029 MONTANA FLATHEAD
PACIFIC NORTHWEST 130200
CLARK FORK-PEND OREILLE
113FORS1 861011 17010206
0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	MEDIUM	SMK OR DEPTH (FT)	00065 STREAM STAGE FEET	00055 STREAM VELOCITY FT/SEC	00060 STREAM FLOW CFS	00076 TURB TRBIDMTR HACH FTU	80154 SUSP SED CONC MG/L	80225 BEDLOAD DISCHARG TONS/DAY	00665 PHOS-TOT MG/L P	00300 DO MG/L	00400 PH SU	00094 CNDUCTVY FIELD MICROMHO
86/04/11	1400	WATER		2.44		243J	.2	4					160
86/04/21	1130	WATER		2.12	2.7	172	.4	2		.005	12.2	7.40	169
86/05/02	1320	WATER		2.19		180J	.7	1				7.40	167
86/05/06	1330	WATER		2.86	4.0	408	1.1	5		.006	10.6	7.30	149
86/05/12	1400	WATER		2.58	3.6	318	.6	.3	.65	.006	12.2	7.40	157
86/05/23	1320	WATER		3.20	5.3	597	1.5		3.53	.010	11.6	7.30	133
86/05/27	1530	WATER		3.70	7.0	1035	10.0	460	41.47	.024	13.4	7.30	107
86/06/02	1600	WATER		3.60	6.3	902	2.0	1	2.16	.016	12.4	7.40	106
86/06/09	1300	WATER		2.80	4.4	420	1.1	8	.21	.007	11.6	7.40	128
86/06/16	1430	WATER		2.37	2.9	208	.3	3	.14	.005	10.0	7.50	141
86/06/23	1100	WATER		2.09	2.8	167	.7	1.0	.00	.003		7.50	162
86/06/30	1340	WATER		1.95	2.6	124	.6	.7	.00	.004	9.8	7.40	170
86/07/10	1610	WATER		1.79		79J	.3	1	.00	.006	10.0	7.80	172
86/07/17	1321	WATER		1.82	1.8	82	.5	1	.00	.004	10.6	7.50	177
86/07/24	0900	WATER		1.68	1.8	66	.4	.7	.00	.004	10.6	7.70	180
86/08/04	1300	WATER		1.56	1.3	43	.6	2		.004	9.8	7.70	185
86/08/19	1230	WATER		1.45	1.4	38	.5	4		.005	10.6	7.70	193
86/09/03	1230	WATER			1.4	36	.4	.8		.002	10.4	7.80	197

FL7012
48 35 51 0 114 13 24 0 3
BIG CR @ LOOKOUT BRIDGE
30029 MONTANA FLATHEAD
PACIFIC NORTHWEST 130200
CLARK FORK-PEND OREILLE
113FORS1 861011 17010206
0000 FEET DEPTH

/TYPA/AMBNT/STREAM

DATE FROM TO	TIME OF DAY	MEDIUM	SMK OR DEPTH (FT)	00011 WATER TEMP FAHN	00021 AIR TEMP FAHN	31616 FEC COLI MFM-FCBR /100ML	31673 FECSTREP MFKFAGAR /100ML
86/04/21	1130	WATER		40.0	62.0		
86/05/02	1320	WATER		39.0	57.0		
86/05/06	1330	WATER		38.0	57.0		
86/05/12	1400	WATER		38.0	48.0		
86/05/23	1320	WATER		39.0	68.0		
86/05/27	1530	WATER		48.0	88.0		
86/06/02	1600	WATER		50.0	70.0		
86/06/09	1300	WATER		46.0	65.0		
86/06/16	1430	WATER		50.0	69.0		
86/06/23	1100	WATER		52.0	68.0		
86/06/30	1340	WATER		46.0	54.0		
86/07/10	1610	WATER		51.0	56.0		
86/07/17	1321	WATER		44.0	46.0		
86/07/24	0900	WATER		50.0	54.0		
86/08/04	1300	WATER		57.0	92.0		
86/08/19	1230	WATER		52.0	77.0		
86/09/03	1230	WATER		50.0	70.0		

FL7013
48 28 05.0 114 04 17.0 3
N FK FLATHEAD RIVER @ BLANKENSHIPS
30029 MONTANA FLATHEAD
PACIFIC NORTHWEST 130200
CLARK FORK-PEND OREILLE
113FORS1 861004 17010208
0000 FEET DEPTH

/TYPA/AMBNT/STREAM

DATE FROM TO	TIME OF DAY	MEDIUM	SMK OR DEPTH (FT)	00065 STREAM STAGE FEET	00055 STREAM VELOCITY FT/SEC	00060 STREAM FLOW CFS	00076 TURB TRBIDMTR HACH FTU	80154 SUSP SED CONC MG/L	80225 BEDLOAD DISCHARG TONS/DAY	00665 PHOS-TOT MG/L P	00300 DO MG/L	00400 PH SU	00094 CNDUCTVY FIELD MICROMHO
86/05/02	1425	WATER					.1						182
86/05/14		WATER					1.0						162
86/06/24	1440	WATER					.7L						167
86/07/11	1300	WATER					.8						182
86/07/31	1320	WATER					.5						200
86/08/13	1410	WATER					.5						204
86/08/25	1435	WATER					.5						214
86/09/11	0820	WATER					.9						212

/TYPA/AM3NT/STREAM

FL7013
48 28 05.0 114 04 17.0 3
N FK FLATHEAD RIVER @ BLANKENSHIPS
30029 MONTANA FLATHEAD
PACIFIC NORTHWEST 130200
CLARK FORK-PEND OREILLE
113FORS1 861004 17010208
0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	MEDIUM	SMK OR DEPTH (FT)	00011 WATER TEMP FAHN	00021 AIR TEMP FAHN	31616 FEC COLI MFM-FCBR /100ML	31673 FECSTREP MFKFAGAR /100ML
86/04/14		WATER				1	1K
86/05/02	1425	WATER		45.0	67.0	1K	1K
86/05/07		WATER				1K	1K
86/05/14		WATER				1K	1K
86/05/28		WATER				104	78
86/06/09		WATER				2	2
86/06/24	1440	WATER		59.0	85.0	4	1K
86/07/11	1300	WATER		54.0	59.0	10	18
86/07/31	1320	WATER		59.0	71.0	1K	1
86/08/13	1410	WATER		62.0	81.0	2	1K
86/08/25	1435	WATER		59.0	82.0	1	1
86/09/11	0820	WATER		48.0	40.0	7	72

FL1026
48 10 57.0 114 01 05.0 3
KRAUSE CR AT FS BDRY
30029 MONTANA FLATHEAD
PACIFIC NORTHWEST 130200
CLARK FORK-PEND OREILLE
113FORS1 801101 17010208 HQ
0000 FEET DEPTH

/TYPA/AMBNT/STREAM

INDEX
MILES

DATE FROM TO	TIME OF DAY	MEDIUM	SMK OR DEPTH (FT)	00065 STREAM STAGE FEET	00055 STREAM VELOCITY FT/SEC	00060 STREAM FLOW CFS	00076 TURB TRBIDMTR HACH FTU	80154 SUSP SED CONC MG/L	80225 BEDLOAD DISCHARG TONS/DAY	00665 PHOS-TOT MG/L P	00300 DO MG/L	00400 PH SU	00094 CNDUCTVY FIELD MICROMHO
86/04/01	1400	WATER			2.0	5	125.0	1055			10.2	7.90	234
86/04/14	1500	WATER			2.1	6	145.0	684					234
86/04/23	1500	WATER			2.5	7	72.0	1770		.026		7.50	266
86/05/01	1430	WATER			2.4	5	130.0	115	3.78	.328		7.80	118
86/05/09	0930	WATER			3.1	11	130.0	592	40.90	.160	11.2	7.50	234
86/05/12	1525	WATER			4.3	15	140.0		10.93	.209	11.0		251
86/05/19	1400	WATER			2.7	9	.8	133	4.15	.031	12.2	7.70	243
86/05/30	0930	WATER			3.4	16	130.0	2279	176.89	.701	10.0	7.60	222
86/06/04		WATER			3.2	17	47.0	146	10.37	.028	10.0	7.40	218
86/06/12	1500	WATER			2.4	11	.6	21	3.10	.015	10.2	7.70	234
86/06/17	1430	WATER			2.1	8	.1	14	.00		9.6	7.70	227
86/06/24	1420	WATER			1.4	4	.7L	6			10.6	8.30	245
86/07/01	1415	WATER			1.4	4	12.0	17	.00	.009	10.2	7.90	241
86/07/08	1529	WATER			1.1	3	7.7	15	.00	.009	10.0	7.70	255
86/07/17	1330	WATER			1.2	2	12.0	21	.00	.013	10.2	7.90	251
86/07/30	1400	WATER			.8	1	1.6	3	.00	.004	11.4	7.90	264
86/08/14	1520	WATER			.7	.7	.6	2	.00	.004	8.4	8.00	257
86/09/08	1430	WATER			.5	.5	1.1	2		.002	9.8	8.50	266

FL1026
48 10 57.0 114 01 05.0 3
KRAUSE CR AT FS BDRY
30029 MONTANA FLATHEAD
PACIFIC NORTHWEST 130200
CLARK FORK-PEND OREILLE
113FORS1 801101 17010208 HG
0000 FEET DEPTH

/TYPA/AMBNT/STREAM

INDEX
MILES

DATE FROM TO	TIME OF DAY	MEDIUM	SMK OR DEPTH (FT)	00011 WATER TEMP FAHN	00021 AIR TEMP FAHN	31616 FEC COLI MFM-FCBR /100ML	31673 FECSTREP MFKFAGAR /100ML
86/04/01	1400	WATER		38.0	56.0		
86/04/23	1500	WATER		39.0	46.0		
86/05/01	1430	WATER		44.0	63.0		
86/05/09	0930	WATER		39.0	47.0		
86/05/12	1525	WATER		40.0	48.0		
86/05/19	1400	WATER		48.0	70.0		
86/05/30	0930	WATER		42.0	62.0		
86/06/04		WATER		42.0	64.0		
86/06/12	1500	WATER		47.0	75.0		
86/06/17	1430	WATER		52.0	72.0		
86/06/24	1420	WATER		54.0	80.0		
86/07/01	1415	WATER		56.0	72.0		
86/07/08	1529	WATER		54.0	64.0		
06/07/17	1330	WATER		46.0	50.0		
06/07/30	1400	WATER		53.0	69.0		
86/08/14	1520	WATER		58.0	74.0		
86/09/08	1430	WATER		51.0	60.0		

FL4001
47 57 02.0 113 21 02.0 3
WHITCOMB C, LOWER 42 MI. SE HUNGRY HORSE, MT.
30029 MONTANA FLATHEAD
PACIFIC NORTHWEST 130200
CLARK FORK-PEND OREILLE RIVER
113FORS1 801101 17010209 HG
0000 FEET DEPTH

/TYPA/AMBNT/STREAM

INDEX
MILES

DATE FROM TO	TIME OF DAY	MEDIUM	SMK OR DEPTH (FT)	00065 STREAM STAGE FEET	00055 STREAM VELOCITY FT/SEC	00060 STREAM FLOW CFS	00076 TURB TRBIDMTR HACH FTU	80154 SUSP SED CONC MG/L	80225 BEDLOAD DISCHARG TONS/DAY	00665 PHOS-TOT MG/L P	00300 DO MG/L	00400 PH SU	00094 CNDUCTVY FIELD MICROMHO
86/05/06	1440	WATER		1.38	2.8	31	.2	5					115
86/05/13	1430	WATER		1.19	3.2	28	.1	6			11.0		127
86/05/20	1300	WATER		1.50	2.9	43	3.0	14			10.4	7.40	102
86/05/28	1410	WATER		1.70	6.8	149						7.20	
86/06/03	1230	WATER		1.70	4.7	75	7.3	15			10.4	7.20	90
86/06/11	1330	WATER		1.25	3.2	32	1.0	3			11.2	7.50	102
86/06/18	1300	WATER		1.05	2.0	14	.08	2			10.6	8.00	89
86/06/23	1300	WATER		.98	1.6	10	.5	.8			11.2	7.50	149
86/06/30	1230	WATER		.90	1.3	8	.7	.3K			10.0	7.60	160
86/07/07	1155	WATER		.93	1.0	6	6.9	.5			10.4	7.30	156
86/07/16	1130	WATER		.95	1.7	7	.8	1			9.8	7.70	84
86/07/29	1200	WATER		.82	1.0	3	.4	.5			9.4	7.60	176
86/08/11	1130	WATER		.77	.8	2	.4	.3			9.4	7.50	193
86/08/26	1100	WATER		.73	1.0	2	.6	1			10.0	7.50	208

FL4001
47 57 02.0 113 21 02.0 3
WHITCOMB C, LOWER 42 MI.SE HUNGRY HORSE, MT.
30029 MONTANA FLATHEAD
PACIFIC NORTHWEST 130200
CLARK FORK-PEND OREILLE RIVER
113FORS1 801101 17010209 HQ
0000 FEET DEPTH

/TYPA/AMBNT/STREAM

INDEX
MILES

DATE FROM TO	TIME OF DAY	MEDIUM	SMK OR DEPTH (FT)	00011 WATER TEMP FAHN	00021 AIR TEMP FAHN	31616 FEC COLI MFM-FCBR /100ML	31673 FECSTREP MFKFAGAR /100ML
86/05/13	1430	WATER		40.0	49.0		
86/05/20	1300	WATER		41.0	82.0		
86/05/28	1410	WATER		42.0	86.0		
86/06/03	1230	WATER		40.0	72.0		
86/06/11	1330	WATER		48.0	72.0		
86/06/18	1300	WATER		52.0	64.0		
86/06/23	1300	WATER		50.0	70.0		
86/06/30	1230	WATER		46.0	53.0		
86/07/07	1155	WATER		46.0	58.0		
86/07/16	1130	WATER		46.0	56.0		
86/07/29	1200	WATER			61.0		
86/08/11	1130	WATER		50.0	65.0		
86/08/26	1100	WATER		48.0	62.0		

FL4004
48 00 30.0 113 42 23.0 3
SULLIVAN CR 31 MI. SSW HUNGRY HORSE, MT.
30029 MONTANA FLATHEAD
PACIFIC NORTHWEST 130200
CLARK FORK-PEND OREILLE RIVER
113FORS1 B01101 17010209 HG
0000 FEET DEPTH

/TYPA/AM8NT/STREAM

INDEX
MILES

DATE FROM TO	TIME OF DAY	MEDIUM	SMK OR DEPTH (FT)	00065 STREAM STAGE FEET	00055 STREAM VELOCITY FT/SEC	00060 STREAM FLOW CFS	00076 TURB TRBIDMTR HACH FTU	B0154 SUSP-SED CONC MG/L	B0225 BEDLOAD DISCHARG TONS/DAY	00665 PHOS-TOT MG/L P	00300 DO MG/L	00400 PH SU	00094 CNDUCTVY FIELD MICROMHO
86/05/07	1430	WATER		1.90	3.8	345	1.0	1			10.6	7.30	106
86/05/13		WATER		1.59	3.8	307	1.0	4			11.6		128
86/05/20	1530	WATER		2.20	5.1	468	1.1	8			10.6	7.30	122
86/05/28	0900	WATER		2.85	6.9	899	12.0	46			11.6	7.20	110
86/06/04	1000	WATER		2.20	4.4	410	1.3	4			10.4	7.20	121
86/06/12	1030	WATER			2.8	215	.6	2			9.6	7.30	134
86/06/17	1000	WATER		1.18	2.3	149	.5	3		.003	12.8	7.70	128
86/06/24	1000	WATER		.80	2.1	80	.3L	2			11.6	7.50	147
86/07/01	1000	WATER		.64	1.8	61	.8	.3K			10.8	7.70	141
86/07/08	1000	WATER		.63	1.9	63	.8	5			10.0	7.30	147
86/07/15	1245	WATER		.84	1.8	78	.4	1.0			9.6	7.70	75
86/07/28	0945	WATER		.44	1.4	38	.8	4			11.4	7.60	138
86/08/14	1000	WATER		.24	1.2	22	.6	4			9.6	7.70	96
86/08/27	1245	WATER		.16	.6	15	.5	2			8.8	7.60	170

FL4004
48 00 30.0 113 42 23.0 3
SULLIVAN CR 31 MI. SSW HUNGRY HORSE, MT.
30029 MONTANA FLATHEAD
PACIFIC NORTHWEST 130200
CLARK FORK-PEND OREILLE RIVER
113FORS1 801101 17010209 HQ
0000 FEET DEPTH

/TYPA/AMBNT/STREAM

INDEX
MILES

DATE FROM TO	TIME OF DAY	MEDIUM	SMK OR DEPTH (FT)	00011 WATER TEMP FAHN	00021 AIR TEMP FAHN	31616 FEC COLI MFM-FCBR /100ML	31673 FECSTREP MFKFAGAR /100ML
86/05/07	1430	WATER		41.0	63.0		
86/05/13		WATER		49.0	47.0		
86/05/20	1530	WATER		45.0	70.0		
86/05/28	0900	WATER		38.0	58.0		
86/06/04	1000	WATER		40.0	66.0		
86/06/12	1000	WATER		43.0	56.0		
86/06/17	1000	WATER		52.0	64.0		
86/06/24	1000	WATER		45.0	66.0		
86/07/01	1000	WATER		50.0	70.0		
86/07/08	1000	WATER		48.0	56.0		
86/07/15	1245	WATER		51.0	67.0		
86/07/28	0945	WATER		48.0	59.0		
86/08/14	1000	WATER		53.0	57.0		
86/08/27	1245	WATER		56.0	76.0		

FL4003
47 57 28.0 113 21 12.0 3
WHITCOMB C. UPPER 41 MI. SE HUNGRY HORSE MT
30029 MONTANA FLATHEAD
PACIFIC NORTHWEST 130200
CLARK FORK-PEND OREILLE RIVER
113FORS1 801101 17010209 HG
0000 FEET DEPTH

/TYPA/AMBNT/STREAM

INDEX
MILES

DATE FRCM TO	TIME OF DAY	MEDIUM	SMK OR DEPTH (FT)	00065 STREAM STAGE FEET	00055 STREAM VELOCITY FT/SEC	00060 STREAM FLOW CFS	00076 TURB TRBIDMTR HACH FTU	80154 SUSP SED CONC MG/L	80225 BEDLOAD DISCHARG TONS/DAY	00665 PHOS-TOT MG/L P	00300 DO MG/L	00400 PH SU	00094 CNDUCTVY FIELD MICROMHO
86/05/13	1245	WATER			2.5	16		4			11.5		
86/05/20	1000	WATER			2.9	25	1.2	88			12.0	7.30	109
86/05/28	1215	WATER				60J	19.0	198			11.6	7.20	88
86/06/03	1030	WATER				127J	3.5	14			12.2	7.50	106
86/06/11	1030	WATER			2.3	25	.9	4			12.0	7.40	81
86/06/18	1115	WATER			1.6	11	1.0	2			11.2	7.50	146
86/06/24	1100	WATER			1.1	6	1.0	2			11.6	7.60	160
86/07/07	1010	WATER			.9	4	1.0	.9			12.4	7.40	146
86/07/16	1000	WATER			.9	4	1.0	1			10.6		146
86/07/29	1030	WATER			.4	1	.7	2			11.0	7.70	181
86/08/11	1030	WATER			.2	.6	.5	.3			9.6	7.70	187
86/08/26	1015	WATER			.1	.2	.6	2			10.2	7.50	205

FL4005
47 57 28.0 113 21 12.0 3
WHITCOMB C. UPPER 41 MI. SE HUNGRY HORSE MT
30029 MONTANA FLATHEAD
PACIFIC NORTHWEST 130200
CLARK FORK-PEND OREILLE RIVER
113FORS1 801101 17010209 HQ
0000 FEET DEPTH

/TYPA/AMBNT/STREAM

INDEX
MILES

DATE FROM TO	TIME OF DAY	MEDIUM	SMK OR DEPTH (FT)	00011 WATER TEMP FAHN	00021 AIR TEMP FAHN	31616 FEC COLI MFM-FCBR /100ML	31673 FECSTREP MFKFAGAR /100ML
86/05/13	1245	WATER		38.0	49.0		
86/05/20	1000	WATER		35.0	64.0		
86/05/28	1215	WATER		38.0	70.0		
86/06/03	1030	WATER		38.0	62.0		
86/06/11	1030	WATER		43.0	62.0		
86/06/18	1115	WATER		46.0	64.0		
86/06/24	1100	WATER		45.0	61.0		
86/07/07	1010	WATER		40.0	51.0		
86/07/16	1000	WATER		44.0	56.0		
86/07/29	1030	WATER		44.0	64.0		
86/08/11	1030	WATER		46.0	56.0		
86/08/26	1015	WATER		46.0	50.0		

FL4024
47 57 28.0 113 01 15.0 3
W FK WHITCOMB CR 41 MI SE HUNGRY HORSE MT
30029 MONTANA FLATHEAD
PACIFIC NORTHWEST 130200
CLARK FORK-PEND OREILLE
113FORS1 801101 17010207 HQ
0000 FEET DEPTH

/TYPA/AMBNT/STREAM

INDEX
MILES

DATE FROM TO	TIME OF DAY	MEDIUM	SMK. OR DEPTH (FT)	00065 STREAM STAGE FEET	00055 STREAM VELOCITY FT/SEC	00060 STREAM FLOW CFS	00076 TURB TRBIDMTR HACH FTU	80154 SUSP SED CONC MG/L	80225 BEDLOAD DISCHARG TONS/DAY	00665 PHOS-TOT MG/L P	00300 DO MG/L	00400 PH SU	00094 CNDUCTVY FIELD MICROMHO
86/05/06	1400	WATER			1.4	5	.1	3					190
86/05/13	1330	WATER			1.2	2	.2	3			10.8		58
86/05/20	1200	WATER			2.1	8	1.5	10			11.8	7.10	41
86/05/28	1300	WATER			4.2	33	20.0	284			11.8	7.00	35
86/06/03	1100	WATER			2.7	17	1.8	11			12.8	7.00	32
86/06/11	1130	WATER			2.4	7	1.1	1			10.0	7.20	40
86/06/18	1145	WATER			1.0	2	.1	2			9.6	7.50	47
86/06/23	1200	WATER			.5	.7	.9	1			11.2	7.20	57
86/06/30	1130	WATER			.1	.09	.8	.3K			10.2	7.40	78
86/07/07	1115	WATER			.2	.3	1.0	2			10.0	7.30	68
86/07/16	1100	WATER			.5	.5	.9	1			9.8	7.10	69

FL4024
47 57 28.0 113 01 15.0 3
W FK WHITCOMB CR 41 MI SE HUNGRY HORSE MT
30029 MONTANA FLATHEAD
PACIFIC NORTHWEST 130200
CLARK FORK-PEND OREILLE
113FORS1 801101 17010207 HG
0000 FEET DEPTH

/TYPA/AMBNT/STREAM

INDEX
MILES

DATE FROM TO	TIME OF DAY	MEDIUM	SMK OR DEPTH (FT)	00011 WATER TEMP FAHN	00021 AIR TEMP FAHN	31616 FEC COLI MFM-FCBR /100ML	31673 FECSTREP MFMFAGAR /100ML
86/05/13	1330	WATER		40.0	49.0		
86/05/20	1200	WATER		42.0	73.0		
86/05/28	1300	WATER		40.0	68.0		
86/06/03	1100	WATER		40.0	59.0		
86/06/11	1130	WATER		50.0	68.0		
86/06/18	1145	WATER		46.0	62.0		
86/06/23	1200	WATER		50.0	72.0		
86/06/30	1130	WATER		46.0	54.0		
86/07/07	1115	WATER		45.0	66.0		
86/07/16	1100	WATER		45.0	57.0		

FL4026
47 55 26.0 113 31 27.0 3
S FK FLATHEAD RIVER @ SPOTTED BEAR RS
30029 MONTANA FLATHEAD
PACIFIC NORTHWEST 130200
CLARK FORK-PEND OREILLE
113FORS1 861004 17010209
0000 FEET DEPTH

/TYPA/AMBNT/STREAM

DATE FROM TO	TIME OF DAY	MEDIUM	SMK OR DEPTH (FT)	00065 STREAM STAGE FEET	00055 STREAM VELOCITY FT/SEC	00060 STREAM FLOW CFS	00076 TURB TRBIDMTR HACH FTU	80154 SUSP SED CONC MG/L	80225 BEDLOAD DISCHARG TONS/DAY	00665 PHOS-TOT MG/L P	00300 DO MG/L	00400 PH SU	00094 CNDUCTVY FIELD MICROMHO
86/06/11		WATER					1.6						123
86/06/26	1430	WATER					.8						147
86/07/07		WATER					.5						163
86/07/29	1215	WATER					.2						187
86/08/11	1245	WATER					.3						197
86/08/26	1245	WATER					.6						208
86/09/11	1100	WATER					.5						198

/TYPA/AMBNT/STREAM

FL4026
47 55 26.0 113 31 27.0 3
S FK FLATHEAD RIVER @ SPOTTED BEAR RS
30029 MONTANA FLATHEAD
PACIFIC NORTHWEST 130200
CLARK FORK-PEND OREILLE
113FORS1 861004 17010209
0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	MEDIUM	SMK OR DEPTH (FT)	00011 WATER TEMP FAHN	00021 AIR TEMP FAHN	31616 FEC COLI MFM-FCBR /100ML	31673 FECSTREP MFMFAGAR /100ML
86/05/06	1540	WATER				1K	1
86/05/13		WATER				1K	1K
86/05/28		WATER				62	18
86/06/11		WATER				1K	1K
86/06/26	1430	WATER		55.0	82.0	1K	1K
86/07/07		WATER				1K	1
86/07/29	1215	WATER		58.0	68.0	1K	1K
86/08/11	1245	WATER		61.0	76.0	1	1
86/08/26	1245	WATER		59.0	80.0	2	1K
86/09/11	1100	WATER		50.0	55.0	1	36

FL6003
48 20 52.0 113 57 17.0 3
WOUNDED BUCK CR 10 MI. SSE HUNGRY HORSE MT
30029 MONTANA FLATHEAD
PACIFIC NORTHWEST 130200
CLARK FORK-PEND OREILLE RIVER
113FORS1 801101 17010209 HQ
0000 FEET DEPTH

/TYPA/AMBNT/STREAM

INDEX
MILES

DATE FROM TO	TIME OF DAY	MEDIUM	SMK OR DEPTH (FT)	00065 STREAM STAGE FEET	00055 STREAM VELOCITY FT/SEC	00060 STREAM FLOW CFS	00076 TURB TRBIDMTR HACH FTU	80154 SUSP SED CONC MG/L	80225 BEDLOAD DISCHARG TONS/DAY	00665 PHOS-TOT MG/L P	00300 DO MG/L	00400 PH SU	00094 CNDUCTVY FIELD MICROMHO
86/04/25	1400	WATER		.79	1.9	11	.3	2				7.30	149
86/05/01	1100	WATER		.64	1.5	82	.3	2				7.40	197
86/05/07	1100	WATER		.94	2.6	148		.6			11.4	7.50	180
86/05/12	1230	WATER		.83	2.8	138	.7	3			12.3		189
86/05/19	1200	WATER		.76	1.8	106	.4	4			13.0	7.40	107
86/05/27	1100	WATER		1.30	3.8	253	1.0	12			12.8	7.30	160
86/06/02	1230	WATER		1.38	4.0	273	1.0	8			10.6	7.40	156
86/06/09	1300	WATER		1.03	2.7	171	.6	2			10.2	7.50	167
86/06/16	1030	WATER		.85	2.6	142	.2	2			10.0	7.70	172
86/06/24	1230	WATER		.68	1.6	81	.4	1			13.2	7.90	185
86/07/02	1130	WATER		.58	1.7	79	.5				10.6	7.30	194
86/07/07	1020	WATER		.55	1.5	62	.4	.9			11.2	7.80	178
86/07/15	0930	WATER		.51		51J	.2	.6			11.2	8.00	186
86/07/22	0845	WATER		.50	1.3	49	1.0				10.4	7.70	184
86/08/07	1015	WATER		.35	1.7	29	.5	2			10.2	7.70	202
86/08/21	1020	WATER		.27	.9	28	.5	2			10.4	7.80	325
86/09/10	0945	WATER		.26	.9	28	.7	.4K			9.6	7.70	208

FL6003
48 20 52.0 113 57 17.0 3
WOUNDED BUCK CR 10 MI. SSE HUNGRY HORSE MT
30029 MONTANA FLATHEAD
PACIFIC NORTHWEST 130200
CLARK FORK-PEND OREILLE RIVER
113FORS1 801101 17010209 HQ
0000 FEET DEPTH

/TYPA/AMBNT/STREAM

INDEX
MILES

DATE FROM TO	TIME OF DAY	MEDIUM	SMK OR DEPTH (FT)	00011 WATER TEMP FAHN	00021 AIR TEMP FAHN	31616 FEC COLI MFM-FCBR /100ML	31673 FECSTREP MFMFAGAR /100ML
86/04/25	1400	WATER		38.0	43.0		
86/05/01	1100	WATER		37.0	52.0		
86/05/07	1100	WATER		38.0	53.0		
86/05/12	1230	WATER		38.0	41.0		
86/05/19	1200	WATER		40.0	68.0		
86/05/27	1100	WATER		44.0	80.0		
86/06/02	1230	WATER		42.0	85.0		
86/06/09	1300	WATER		46.0	66.0		
86/06/16	1030	WATER		46.0	66.0		
86/06/24	1230	WATER		48.0	71.0		
86/07/02	1130	WATER		48.0	78.0		
86/07/07	1020	WATER		45.0	62.0		
86/07/15	0930	WATER		44.0	54.0		
86/07/22	0845	WATER		45.0	52.0		
86/08/07	1015	WATER		46.0	58.0		
86/08/21	1020	WATER		45.0	47.0		
86/09/10	0945	WATER		44.0	48.0		

FL6005
48 13 52.0 113 19 15.0 3
CHALLENGE CR 13 MI ENE ESSEX MT
30029 MONTANA FLATHEAD
PACIFIC NORTHWEST 130200
CLARK FORK-PEND OREILLE
113FORS1 801101 17010207 HG
0000 FEET DEPTH

/TYPA/AMBNT/STREAM

INDEX
MILES

DATE FROM TO	TIME OF DAY	MEDIUM	SMK OR DEPTH (FT)	00065 STREAM STAGE FEET	00055 STREAM VELOCITY FT/SEC	00060 STREAM FLOW CFS	00076 TURB TRBIDMTR HACH FTU	80154 SUSP SED CONC MG/L	80225 BEDLOAD DISCHARG TONS/DAY	00665 PHOS-TOT MG/L P	00300 DO MG/L	00400 PH SU	00094 CNDUCTVY FIELD MICROMHO
86/05/29	0945	WATER			3.6	69	3.5	14		.023	11.2	7.30	84
86/06/05	1130	WATER			3.1	31	1.7	2		.019	9.4	7.30	118
86/06/12	1045	WATER			2.1	13	.6	2		.008	11.0	7.50	78
86/06/19	1015	WATER			1.6	7	1.1	3		.024	9.8	7.40	172
86/06/25	1015	WATER			1.6	7	.4	.4K		.006	9.6	7.70	178
86/07/02	1010	WATER			1.4	5	.5			.007	9.6	7.60	188
86/07/09	1000	WATER			1.2	10	.5	1		.009	10.0	7.40	189
86/07/16	0930	WATER			1.0	3	.4	1		.007	10.4	7.50	199
86/07/23	1100	WATER			.8	4	.4	.3		.008	11.0	7.50	192
86/08/05	1015	WATER			.6	2	.3	.3		.007	8.2	7.80	212
86/08/18	1115	WATER			.5	1	.3	1		.006	9.8	7.80	213
86/09/09	1045	WATER			2.2	16	4.0	4		.014	9.6	7.40	141

FL6005
48 13 52.0 113 19 15.0 3
CHALLENGE CR 13 MI ENE ESSEX MT
30029 MONTANA FLATHEAD
PACIFIC NORTHWEST 130200
CLARK FORK-PEND OREILLE
113FORS1 801101 17010207 HQ
0000 FEET DEPTH

/TYPA/AMBNT/STREAM

INDEX
MILES

DATE FROM TO	TIME OF DAY	MEDIUM	SMK OR DEPTH (FT)	00011 WATER TEMP FAHN	00021 AIR TEMP FAHN	31616 FEC COLI MFM-FCBR /100ML	31673 FECSTREP MFKFAGAR /100ML
86/05/29	0945	WATER		38.0	64.0		
86/06/05	1130	WATER		41.0	63.0		
86/06/12	1045	WATER		46.0	64.0		
86/06/19	1015	WATER		42.0	49.0		
86/06/25	1015	WATER		50.0	71.0		
86/07/02	1010	WATER			74.0		
86/07/09	1000	WATER		46.0	54.0		
86/07/16	0930	WATER		45.0	49.0		
86/07/23	1100	WATER		52.0	72.0		
86/08/05	1015	WATER		50.0	54.0		
86/08/18	1115	WATER		50.0	78.0		
86/09/09	1045	WATER		42.0	42.0		

FL6007
48 16 57.0 113 21 32.0 3
SKYLAND C AB WF SKYLAND C
30029 MONTANA FLATHEAD
PACIFIC NORTHWEST 130200
CLARK FORK-PEND OREILLE
113FOR81 801101 17010207 HG
0000 FEET DEPTH

/TYPA/AMBNT/STREAM

INDEX
MILES

DATE FROM TO	TIME OF DAY	MEDIUM	SMK OR DEPTH (FT)	00065 STREAM STAGE FEET	00055 STREAM VELOCITY FT/SEC	00060 STREAM FLOW CFS	00076 TURB TRBIDMTR HACH FTU	80154 SUSP SED CONC MG/L	80225 BEDLOAD DISCHARG TONS/DAY	00665 PHOS-TOT MG/L P	00300 DO MG/L	00400 PH SU	00094 CNDUCTVY FIELD MICROMHO
86/05/14	1100	WATER		1.73	3.7	25	.6	5		.005	11.2		149
86/05/22	1100	WATER		2.00		44J		4		.020	10.0	7.10	
86/05/29	1330	WATER			2.8	61	2.5	13		.013	13.2	7.30	87
86/06/05	1400	WATER		1.88	1.0	29	1.7	4		.020	12.4	7.20	119
86/06/12	1330	WATER		1.69	1.2	16	.4	3		.014	12.4	7.60	102
86/06/19	1430	WATER		1.62	.9	12	1.1	3		.012	11.2	7.40	188
86/06/25	1230	WATER		1.56	.7	8	.4L	.9		.010	8.2	7.50	202
86/07/02	1130	WATER		1.54	.8	8	.4	.3		.009	10.6	7.60	224
86/07/09	1145	WATER		1.52	1.1	7	.5	2		.010	10.6	4.70	214
86/07/16	1330	WATER								.008			
86/07/23	1320	WATER		1.48	.7	7	.6	.5		.009	11.4	8.40	267
86/08/05	1245	WATER			.7	7	.5	.7			8.6	7.60	197
86/08/15	1245	WATER								.008			
86/08/18	1315	WATER			.7	6	.4	2		.007	10.2	7.80	320
86/09/09	1230	WATER		1.63	1.1	14	4.5	7		.025	9.6	7.30	190

FL6009
48 16 57.0 113 21 32.0 3
SKYLAND C AB WF SKYLAND C
30029 MONTANA FLATHEAD
PACIFIC NORTHWEST 130200
CLARK FORK-PEND OREILLE
113FORS1 801101 17010207 HG
0000 FEET DEPTH

/TYPA/AMBNT/STREAM

INDEX
MILES

DATE FROM TO	TIME OF DAY	MEDIUM	SMK OR DEPTH (FT)	00011 WATER TEMP FAHN	00021 AIR TEMP FAHN	31616 FEC COLI MFM-FCBR /100ML	31673 FECSTREP MFKFAGAR /100ML
86/05/14	1100	WATER		33.0	34.0		
86/05/22	1100	WATER		34.0	34.0		
86/05/29	1330	WATER		42.0			
86/06/05	1400	WATER		42.0	62.0		
86/06/12	1330	WATER		48.0	61.0		
86/06/19	1430	WATER		44.0	64.0		
86/06/25	1230	WATER		45.0	76.0		
86/07/02	1150	WATER		50.0	75.0		
86/07/09	1145	WATER		43.0	64.0		
86/07/23	1320	WATER		48.0	68.0		
86/08/05	1245	WATER		49.0	64.0		
86/08/18	1315	WATER		46.0	70.0		
86/09/09	1230	WATER		41.0	41.0		

FL6010
48 16 56.0 113 21 35.0 3
W FK SKYLAND CR 12 MI E ESSEX MT
30029 MONTANA FLATHEAD
PACIFIC NORTHWEST 130200
CLARK FORK-PEND OREILLE
113FORS1 801101 17010207 HQ
0000 FEET DEPTH

/TYPA/AMBNT/STREAM

INDEX
MILES

DATE FROM TO	TIME OF DAY	MEDIUM	SMK OR DEPTH (FT)	00065 STREAM STAGE FEET	00055 STREAM VELOCITY FT/SEC	00060 STREAM FLOW CFS	00076 TURB TRBIDMTR HACH FTU	80154 SUSP SED CONC MG/L	80225 BEDLOAD DISCHARG TONS/DAY	00665 PHOS-TOT MG/L P	00300 DO MG/L	00400 PH SU	00094 CNDUCTVY FIELD MICROMHO
86/05/14	1030	WATER			2.0	13	.4	3			11.0		104
86/05/22	1030	WATER			2.3	23		5			10.2	7.10	
86/05/29	1245	WATER			2.1	22	1.6	4			12.8	7.30	86
86/06/05	1300	WATER			1.5	11	.8	2			12.4	7.20	97
86/06/12	1245	WATER			1.3	7	.4	1			11.0	7.40	106
86/06/19	1300	WATER			.9	4	.5	3			10.8	7.30	133
86/06/25	1200	WATER			.7	3	.4L	1			10.4	7.50	140
06/07/02	1115	WATER			.9	3	.5	.8			10.0	7.60	148
86/07/09	1100	WATER			.7	4	.6	2			9.8	7.50	154
86/07/16	1132	WATER			.7	3	.8	1.0			10.2	7.30	159
86/07/23	1240	WATER			.8	2	.5	.3			11.0	7.50	90
86/08/05	1130	WATER			.6	1	.7	1			9.8	7.50	171
86/08/18	1245	WATER			.6	1	.3	.6			10.6	7.50	120
86/09/09	1130	WATER			.9	3	4.8	4			8.0	7.30	162

FL6010
48 16 56.0 113 21 35.0 3
W FK SKYLAND CR 12 MI E ESSEX MT
30029 MONTANA FLATHEAD
PACIFIC NORTHWEST 130200
CLARK FORK-PEND OREILLE
113FORS1 801101 17010207 HG
0000 FEET DEPTH

/TYPA/AMBNT/STREAM

INDEX
MILES

DATE FROM TO	TIME OF DAY	MEDIUM	SMK OR DEPTH (FT)	00011 WATER TEMP FAHN	00021 AIR TEMP FAHN	31616 FEC COLI MFM-FCBR /100ML	31673 FECSTREP MFKFAGAR /100ML
86/05/14	1030	WATER		33.0	34.0		
86/05/22	1030	WATER		34.0	33.0		
86/05/29	1245	WATER		46.0	74.0		
86/06/05	1300	WATER		42.0	62.0		
86/06/12	1245	WATER		45.0	64.0		
86/06/19	1300	WATER		42.0	48.0		
86/06/25	1200	WATER		51.0	78.0		
86/07/02	1115	WATER		51.0	64.0		
86/07/09	1100	WATER		45.0	54.0		
86/07/16	1132	WATER		44.0	60.0		
86/07/23	1240	WATER		50.0	68.0		
86/08/05	1130	WATER		48.0	66.0		
86/08/18	1245	WATER		50.0	78.0		
86/09/09	1130	WATER		40.0	41.0		

FL6012
48 13 52.0 113 20 00.0 3
DODGE CR 13 MI ESE ESSEX MT
30029 MONTANA FLATHEAD
PACIFIC NORTHWEST 130200
CLARK FORK-PEND OREILLE
113FORS1 801101 17010207 HQ
0000 FEET DEPTH

/TYPA/AMBNT/STREAM

INDEX
MILES

DATE FROM TO	TIME OF DAY	MEDIUM	SMK OR DEPTH (FT)	00065 STREAM STAGE FEET	00055 STREAM VELOCITY FT/SEC	00060 STREAM FLOW CFS	00076 TURB TRBIDMTR HACH FTU	80154 SUSP SED CONC MG/L	80225 BEDLOAD DISCHARG TONS/DAY	00665 PHOS-TOT MG/L P	00300 DO MG/L	00400 PH SU	00094 CNDUCTVY FIELD MICROMHO
86/05/29	1111	WATER			2.8	36	1.4	6			12.2	7.30	100
86/06/05	1030	WATER			3.0	24	1.0	3			10.4	7.30	106
86/06/12	0945	WATER			2.0	9	.6	2			10.6	7.40	124
86/06/19	1130	WATER			1.4	6	.5	2			9.6	7.30	140
86/06/25	0930	WATER			1.1	3	.3L	.7			11.0	7.30	149
86/07/02	0930	WATER			.8	2	.5	.9K			10.0	7.60	162
86/07/09	0917	WATER			.8	2	.4	1			11.0	7.40	168
86/07/16	1050	WATER			.8	1	.4	.9			10.2	7.40	179
86/07/23	1000	WATER			.5	1	.4	.3			10.0	7.50	183
86/08/05	0930	WATER			.4	.5	.5	.3			9.6	7.50	196
86/08/18	1010	WATER			.1	.1	.4	.3			10.0	7.40	199
86/09/09	1000	WATER			1.1	3	1.3	2			9.6	7.50	184

FL6012
48 13 52.0 113 20 00.0 3
DODGE CR 13 MI ESE ESSEX MT
30029 MONTANA FLATHEAD
PACIFIC NORTHWEST 130200
CLARK FORK-PEND OREILLE
113FORS1 801101 17010207 HQ
0000 FEET DEPTH

/TYPA/AMBNT/STREAM

INDEX
MILES

DATE FROM TO	TIME OF DAY	MEDIUM	SMK OR DEPTH (FT)	00011 WATER TEMP FAHN	00021 AIR TEMP FAHN	31616 FEC COLI MFM-FCBR /100ML	31673 FECSTREP MFKFAGAR /100ML
86/05/29	1111	WATER		42.0	79.0		
86/06/05	1030	WATER		39.0	62.0		
86/06/12	0945	WATER		44.0	52.0		
86/06/19	1130	WATER		41.0	54.0		
86/06/25	0930	WATER		45.0	62.0		
86/07/02	0930	WATER		47.0	57.0		
86/07/09	0917	WATER		42.0	50.0		
86/07/16	1050	WATER		42.0	56.0		
86/07/23	1000	WATER		48.0	64.0		
86/08/05	0930	WATER		45.0	49.0		
86/08/18	1010	WATER		44.0	64.0		
86/09/09	1000	WATER		42.0	42.0		

FL6014
48 14 32.0 113 57 15.0 2
UPPER WOUNDEDBUCK CR 11 MI SSE HUNGRY HORSE MT
30029 MONTANA FLATHEAD
PACIFIC NORTHWEST 130200
CLARK FORK -PEND OREILLE RIVER
113FORS1 820717 17010209 HQ
0000 FEET DEPTH

/TYPA/AMBNT/STREAM

INDEX
MILES

DATE FROM TO	TIME OF DAY	MEDIUM	SMK OR DEPTH (FT)	00065 STREAM STAGE FEET	00055 STREAM VELOCITY FT/SEC	00060 STREAM FLOW CFS	00076 TURB TRBIDMTR HACH FTU	80154 SUSP SED CONC MG/L	80225 BEDLOAD DISCHARG TONS/DAY	00665 PHOS-TOT MG/L P	00300 DO MG/L	00400 PH SU	00094 CNDUCTVY FIELD MICROMHO
86/04/25	1300	WATER		1.46	2.2	43	.4	.6			11.2	7.30	186
86/05/01	1015	WATER		1.34	1.7	27	.5	3				7.50	74
86/05/07	0930	WATER		1.68	2.3	53	.7	.3			10.8	7.40	192
86/05/12	1045	WATER		1.47	3.3	67	1.0	7			13.0		193
86/05/19	0950	WATER		1.43	3.2	61	.4	3			11.0	7.50	190
86/05/27	0930	WATER		2.00	3.3	126					10.2	7.30	
86/06/02	1030	WATER		2.00	3.1	111	.4	5			12.0	7.40	153
86/06/09	1100	WATER		1.65	2.4	60	.3	.9			10.6	7.80	177
86/06/16	0930	WATER		1.51	2.7	49	.2	1			11.2	7.70	178
86/06/24	1020	WATER		1.43	2.1	36	.6	2			11.6	7.90	197
86/07/02	0935	WATER		1.38	2.0	30	.4	1			10.4	7.70	193
86/07/07	0845	WATER		1.36	2.2	30	.3	1			10.4	8.00	186
86/07/15	0930	WATER		1.34		22J	.3	.9			10.0	8.00	206
86/07/22	1000	WATER		1.34	1.8	22	1.0				9.4	7.80	208
86/08/07	0900	WATER		1.30	1.7	12	.3	.3			10.0	8.00	215
86/08/21	0930	WATER		1.24	1.4	8	.6	1			9.8	7.90	216
86/09/10	0900	WATER		1.24	1.4	12	.5	1			10.0	7.80	216

FL6014
48 14 32.0 113 57 15.0 2
UPPER WOUNDEDBUCK CR 11 MI SSE HUNGRY HORSE MT
30029 MONTANA FLATHEAD
PACIFIC NORTHWEST 130200
CLARK FORK -PEND OREILLE RIVER
113FORS1 820717 17010209 HQ
0000 FEET DEPTH

/TYPA/AMBNT/STREAM

INDEX
MILES

DATE FROM TO	TIME OF DAY	MEDIUM	SMK OR DEPTH (FT)	00011 WATER TEMP FAHN	00021 AIR TEMP FAHN	31616 FEC COLI MFM-FCBR /100ML	31673 FECSTREP MFKFAGAR /100ML
86/04/25	1300	WATER		38.0	48.0		
86/05/01	1015	WATER		34.0	41.0		
86/05/07	0930	WATER		36.0	46.0		
86/05/12	1045	WATER		37.0	36.0		
86/05/19	0950	WATER		39.0	54.0		
86/05/27	0930	WATER		38.0	61.0		
86/06/02	1000	WATER		38.0	68.0		
86/06/09	1100	WATER		41.0	58.0		
86/06/16	0930	WATER		44.0	45.0		
86/06/24	1020	WATER		43.0	62.0		
86/07/02	0935	WATER		45.0	56.0		
86/07/07	0845	WATER		42.0	49.0		
86/07/15	0930	WATER		42.0	46.0		
86/07/22	1000	WATER		48.0	56.0		
86/08/07	0900	WATER		45.0	45.0		
86/08/21	0930	WATER		43.0	44.0		
86/09/10	0900	WATER		43.0	44.0		

FL6016
48 07 38.0 113 48 35.0 3
GRAVES CR @ USGS SITE
30029 MONTANA FLATHEAD
PACIFIC NORTHWEST 130200
CLARK FORK-PEND OREILLE
113FORS1 861004 17010209
0000 FEET DEPTH

/TYPA/AM9NT/STREAM

DATE FROM TO	TIME OF DAY	MEDIUM	SMK OR DEPTH (FT)	00065 STREAM STAGE FEET	00055 STREAM VELOCITY FT/SEC	00060 STREAM FLOW CFS	00076 TURB TRBIDMTR HACH FTU	80154 SUSP SED CONC MG/L	80225 BEDLOAD DISCHARG TONS/DAY	00665 PHOS-TOT MG/L P	00300 DO MG/L	00400 PH SU	00094 CNDUCTVY FIELD MICROMHO
86/07/07	1230	WATER		2.81	1.2	97	.5	2			9.8	7.60	141
86/08/14	1215	WATER		2.20	.5	23	.5	.7			9.4	8.00	172
86/08/15	0945	WATER		2.91	1.6	120	.3	1			11.0	7.70	147
86/08/27	1345	WATER		2.10	.4	18	.5	2			8.8	7.60	177

FL6016
48 07 38.0 113 48 35.0 3
GRAVES CR @ USGS SITE
30029 MONTANA FLATHEAD
PACIFIC NORTHWEST 130200
CLARK FORK-PEND OREILLE
113FORS1 861004 17010209
0000 FEET DEPTH

/TYPA/AM3NT/STREAM

DATE FROM TO	TIME OF DAY	MEDIUM	SMK OR DEPTH (FT)	00011 WATER TEMP FAHN	00021 AIR TEMP FAHN	31616 FEC COLI MFM-FCBR /100ML	31673 FECSTREP MFKFAGAR /100ML
86/07/07	1230	WATER		55.0	66.0		
86/09/14	1215	WATER		58.0	74.0		
86/09/15	0945	WATER		48.0	52.0		
86/09/27	1345	WATER		59.0	79.0		

/TYPA/AMBNT/STREAM

FL6017
48 28 03.0 114 04 04.0 3
M FK FLATHEAD RIVER @ BLANKENSHIPS
30029 MONTANA FLATHEAD
PACIFIC NORTHWEST 130200
CLARK FORK-PEND OREILLE
113FORS1 861004 17010207
0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	MEDIUM	SMK OR DEPTH (FT)	00065 STAGE FEET	00055 STREAM VELOCITY FT/SEC	00060 STREAM FLOW CFS	00076 TURB TRBIDMTR HACH FTU	80154 SUSP SED CONC MG/L	80225 BEDLOAD DISCHARG TONS/DAY	00665 PHOS-TOT MG/L P	00300 DO MG/L	00400 PH SU	00094 CNDUCTVY FIELD MICROMHO
86/05/02	1415	WATER					.7						161
86/05/14		WATER					.7						153
86/06/24	1420	WATER					.6L						138
86/07/11		WATER					1.1						139
86/07/31	1300	WATER					.5						158
86/08/13	1430	WATER					.7						162
86/08/26	1415	WATER					.5						172
86/09/11	0835	WATER					.9						174

/TYPA/AMBNT/STREAM

FL6017
48 28 03 0 114 04 04.0 3
M FK FLATHEAD RIVER @ BLANKENSHIPS
30029 MONTANA FLATHEAD
PACIFIC NORTHWEST 130200
CLARK FORK-PEND OREILLE
113FORS1 861004 17010207
0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	MEDIUM	SMK OR DEPTH (FT)	00011 WATER TEMP FAHN	00021 AIR TEMP FAHN	31616 FEC COLI MFM-FCBR /100ML	31673 FECSTREP MFKFAGAR /100ML
86/01/17		WATER				1K	1K
86/05/02	1415	WATER		49.0	67.0	1K	1K
86/05/07		WATER				1K	1
86/05/14		WATER				1K	1K
86/05/28		WATER				75	37
86/06/09		WATER				1	2
86/06/24	1420	WATER		57.0	85.0	1K	3
86/07/11		WATER		51.0	59.0	2	8
86/07/31	1300	WATER		59.0	70.0	1	1
86/08/13	1430	WATER		61.0	81.0	1	1K
86/08/26	1415	WATER		59.0	79.0	1K	1K
86/09/11	0835	WATER		48.0	40.0	10	68

FL8002
48 27 18 0 114 45 15 0 3
GREGG CR 19 MI W WHITEFISH MT
30029 MONTANA FLATHEAD
PACIFIC NORTHWEST 130200
CLARK FORK-PEND OREILLE RIVER
113FORS1 801101 17010210 HQ
0000 FEET DEPTH

/TYPA/AMBNT/STREAM

INDEX
MILES

DATE FROM TO	TIME OF DAY	MEDIUM	SMK CR DEPTH (FT)	00065 STREAM STAGE FEET	00055 STREAM VELOCITY FT/SEC	00060 STREAM FLOW CFS	00076 TURB TRBIDMTR HACH FTU	80154 SUSP SED CONC MG/L	80225 BEDLOAD DISCHARG TONS/DAY	00665 PHOS-TOT MG/L P	00300 DO MG/L	00400 PH SU	00094 CNDUCTVY FIELD MICROMHO
86/04/17	1245	WATER		1.57	2.1	16	.4	.8			11.4	7.20	194
86/04/23	0930	WATER		1.88	2.4	36	1.2	8			13.4	7.30	160
86/04/28	0930	WATER		1.66	2.3	24	.6	.3				7.30	168
86/05/08	0930	WATER		1.90	2.3	35	.7	4			11.2	7.30	160
86/05/14	0930	WATER		1.76	2.2	26	.5	1			12.0	7.40	173
86/05/21	1045	WATER		2.00	2.8	48	1.6	15			13.2	7.70	143
86/05/30	0930	WATER		1.75	2.2	29	.5	6			10.6	7.40	153
86/06/05	0830	WATER		1.59	2.1	17	.5	2			11.8	7.50	172
86/06/13	0900	WATER		1.47	2.1	12	.4	2			10.4	7.40	203
86/06/20	1130	WATER		1.42	1.6	10	1.1	.9				7.40	209
86/06/26		WATER		1.38	1.1	7	.4L	.6			10.8	7.20	213
86/07/03	0910	WATER		1.33	2.1	9	.8	.7			10.6	7.80	217
86/07/09	1100	WATER		1.30	.9	6	.6	2			10.4	7.60	224
86/07/14	0850	WATER		1.30	1.5	6	.5	1			10.2	7.40	214
86/07/31	1045	WATER		1.25	.8	4	.6	1			8.4	7.70	228
86/08/13	1130	WATER		1.19	.7	3	1.0	1			7.8	7.50	228
86/08/25	1100	WATER		1.16	.6	3	.6	.3			9.4	7.70	238

FL8002
48 27 18.0 114 45 15.0 3
GREGG CR 19 MI W WHITEFISH MT
30029 MONTANA FLATHEAD
PACIFIC NORTHWEST 130200
CLARK FORK-PEND OREILLE RIVER
113FORS1 801101 17010210 HQ
0000 FEET DEPTH

/TYPA/AMBNT/STREAM

INDEX
MILES

DATE FROM TO	TIME OF DAY	MEDIUM	SMK OR DEPTH (FT)	00011 WATER TEMP FAHN	00021 AIR TEMP FAHN	31616 FEC COLI MFM-FCBR /100ML	31673 FECSTREP MFKFAGAR /100ML
86/01/17	1245	WATER		37.0	44.0		
86/01/23	0930	WATER		43.0			
86/01/28	0930	WATER		34.0	38.0		
86/05/08	0930	WATER		32.0	50.0		
86/05/14	0930	WATER		33.0	40.0		
86/05/30	0930	WATER		46.0	65.0		
86/06/05	0830	WATER		46.0	58.0		
86/06/13	0900	WATER		42.0	55.0		
86/06/20	1130	WATER		44.0	62.0		
86/06/26		WATER		44.0	60.0		
86/07/03	0910	WATER		49.0	57.0		
86/07/09	1100	WATER		48.0	59.0		
86/07/14	0850	WATER		42.0	59.0		
86/07/31	1045	WATER		49.0	58.0		
86/08/13	1130	WATER		52.0	64.0		
86/08/25	1100	WATER		50.0	56.0		

STORET RETRIEVAL DATE 88/11/04 PAGE 1

FL8009
48 11 31.0 114 36 13.0 2
FISH C TRIB ASHLEY LAKE 6 MI N MARION, MT
30029 MONTANA FLATHEAD
PACIFIC NORTHWEST 130200
CLARK FORK-PEND OREILLE RIVER
113FORS1 820724 17010208 HQ
0000 FEET DEPTH

/TYPA/AMBNT/STREAM

INDEX
MILES

DATE FROM TO	TIME OF DAY	MEDIUM	SMK OR DEPTH (FT)	00065 STREAM STAGE FEET	00055 STREAM VELOCITY FT/SEC	00060 STREAM FLOW CFS	00076 TURB TRBIDMTR HACH FTU	80154 SUSP SED CONC MG/L	80225 BEDLOAD DISCHARG TONS/DAY	00665 PHOS-TOT MG/L P	00300 DO MG/L	00400 PH SU	00094 CNDUCTVY FIELD MICROMHO
86/04/01	1100	WATER		1.20	2.6	14	2.7	4			11.0	7.10	64
86/04/17	1000	WATER		1.02	2.2	8	2.0	.9			12.8	7.10	58
86/04/23	1200	WATER		1.06	2.0	8	2.0	.9			11.8	6.95	52
86/04/28	1300	WATER		.97	1.8	7	2.2	2				7.00	40
86/05/08	1335	WATER		1.06	2.1	9	.2	2			12.6	7.10	43
86/05/14	1430	WATER		.94	1.7	6	1.7	2			10.2	7.00	47
86/05/21	1400	WATER		.83	1.5	4	1.5	2			13.0	7.30	61
86/05/30	1400	WATER		.70	1.0	3	1.3	3				7.30	52
86/06/05		WATER		.64	.8	2	1.7	.6			11.6	7.20	54
86/06/13	1130	WATER		.56	1.3	1		.9			10.6	7.20	
86/06/20	0900	WATER		.50	.5	.7	.9	.9				7.20	62
86/06/26	1440	WATER		.48	.5	.8	.8L	.3			10.0	7.20	54
86/07/03	1245	WATER		.46	.5	.9	1.1	2			10.4	7.20	53
86/07/09	0830	WATER		.44	.5	.7	1.0	1			10.2	7.20	63
86/07/14	1245	WATER		.42	.4	.6	.9	1			9.2	7.10	56
86/07/31	0815	WATER		.34	.5	.6	1.2	2			10.2	7.20	66
86/08/13	0900	WATER		.32	.3	.5	.9	1			8.4	7.10	61
86/09/25	0830	WATER		.30	.3	.4	.9	1			8.8	7.30	63

FL8009
48 11 31.0 114 36 13.0 2
FISH C TRIB. ASHLEY LAKE 6 MI N MARION, MT
30029 MONTANA FLATHEAD
PACIFIC NORTHWEST 130200
CLARK FORK-PEND OREILLE RIVER
113FORS1 820724 17010208 HQ
0000 FEET DEPTH

/TYPA/AMBNT/STREAM

INDEX
MILES

DATE FROM TO	TIME OF DAY	MEDIUM	SMK OR DEPTH (FT)	00011 WATER TEMP FAHN	00021 AIR TEMP FAHN	31616 FEC COLI MFM-FCBR /100ML	31673 FECSTREP MFKFAGAR /100ML
86/04/01	1100	WATER		33.0	39.0		
86/04/17	1000	WATER		35.0	45.0		
86/04/23	1200	WATER		36.0			
86/04/28	1300	WATER		37.0	42.0		
86/05/08	1335	WATER		40.0	58.0		
86/05/14	1430	WATER		36.0	44.0		
86/05/30	1400	WATER		53.0	84.0		
86/06/05		WATER		50.0	61.0		
86/06/13	1130	WATER		48.0	65.0		
86/06/20	0900	WATER		42.0	44.0		
86/06/26	1440	WATER		50.0	69.0		
86/07/03	1245	WATER		50.0	60.0		
86/07/09	0830	WATER		50.0	53.0		
86/07/14	1245	WATER		49.0	66.0		
86/07/31	0815	WATER		47.0	44.0		
86/08/13	0900	WATER		50.0	53.0		
86/08/25	0830	WATER		48.0	45.0		

FL8010
48 10 09.0 114 50 15.0 2
HAND C AT FLUME 24 MI WSW OF WHITEFISH MT
30029 MONTANA FLATHEAD
PACIFIC NORTHWEST 130200
CLARK FORK-PEND OREILLE RIVER
113FORS1 820717 17010102030 0004 160 ON
0000 FEET DEPTH

/TYPA/AM8NT/STREAM

INDEX
MILES

DATE FROM TO	TIME OF DAY	MEDIUM	SMK OR DEPTH (FT)	00065 STREAM STAGE FEET	00055 STREAM VELOCITY FT/SEC	00060 STREAM FLOW CFS	00076 TURB TRBIDMTR HACH FTU	80154 SUSP SED CONC MG/L	80225 BEDLOAD DISCHARG TONS/DAY	00665 PHOS-TOT MG/L P	00300 DO MG/L	00400 PH SU	00094 CNDUCTVY FIELD MICROMHO
86/01/18	1200	WATER		.38		2J	.3	.4		.008	11.4	6.50	31
86/01/24	1200	WATER		.49	1.3	2	.5	.6	.00	.009	10.8	6.70	24
86/01/30	1100	WATER		.39		2J	.6	1		.008		6.30	
86/05/07	1130	WATER		.76	1.0	5	.8	2	.00	.008			21
86/05/15	1000	WATER		.50	1.3	2	.3	0	.00	.008	10.8	6.20	21
86/05/21	1030	WATER		.75	1.5	5		1	.00	.022	9.6	6.30	
86/05/29	1030	WATER		.49	1.2	2	1.0	2	.00	.009	8.2	6.50	24
86/06/04	0900	WATER		.33	1.0	1	.4	.3	.00	.018	8.8	6.30	34
86/06/11	1000	WATER		.26	.4	.8	.3	.3K	.00	.007	8.6	6.50	27
86/06/19	0915	WATER			.7	.5	.5	.5	.00	.006	8.2	6.30	21
86/06/25	0900	WATER			.6	.4	.5L	.6	.00	.004	7.4	6.30	40
86/07/03	1000	WATER		.15		.3J	.5	2		.009	7.6	6.40	29
86/07/10	1125	WATER		.12	.2	.1	.6	1			7.6	6.00	31
86/07/17	0830	WATER		.06	.2	.3	.5	3		.009	8.4	6.10	32
86/07/30		WATER		.09	.1	.1	.6	.3		.009	8.6	6.40	33
86/08/12	0915	WATER		.06	.01	.005	.4	1.0		.007	8.0	6.20	33
86/08/28	0845	WATER		.05		.01J	.6	.6		.007	8.0	6.30	32
86/09/08	1000	WATER		.03		.01J	.4	1		.005	7.8	6.40	33
86/10/22	1130	WATER		.06	.09	.08	1.2				9.0	6.20	33

FLB010
48 10 09.0 114 50 15.0 2
HAND C AT FLUME 24 MI WSW OF WHITEFISH MT
30029 MONTANA FLATHEAD
PACIFIC NORTHWEST 130200
CLARK FORK-PEND OREILLE RIVER
113FORS1 820717 17010102030 0004.160 ON
0000 FEET DEPTH

/TYPA/AM3INT/STREAM

INDEX
MILES

DATE FROM TO	TIME OF DAY	MEDIUM	SMK OR DEPTH (FT)	00011 WATER TEMP FAHN	00021 AIR TEMP FAHN	31616 FEC COLI MFM-FCBR /100ML	31673 FECSTREP MFMFAGAR /100ML
86/04/18	1200	WATER		32.0	40.0		
86/04/24	1200	WATER		33.0	40.0		
86/05/07	1130	WATER		33.0	45.0		
86/05/15	1000	WATER		32.0	43.0		
86/05/21	1030	WATER		36.0	50.0		
86/05/29	1030	WATER		43.0	72.0		
86/06/04	0900	WATER		46.0	54.0		
86/06/11	1000	WATER		42.0	64.0		
86/06/19	0915	WATER		44.0	44.0		
86/04/25	0900	WATER		48.0	60.0		
86/07/03	1000	WATER		46.0	62.0		
86/07/10	1125	WATER		44.0	60.0		
86/07/17	0830	WATER		41.0	45.0		
86/07/30		WATER		44.0	46.0		
86/08/12	0915	WATER		43.0	54.0		
86/08/28	0845	WATER		43.0	50.0		
86/09/08	1000	WATER		42.0	50.0		
86/10/22	1130	WATER		38.0	40.0		

FLB020
48 16 45.0 114 46 25.0 3
SQUAW MEADOWS CR 22 MI SW WHITEFISH MT
30029 MONTANA FLATHEAD
PACIFIC NORTHWEST 130200
CLARK FORK-PEND OREILLE RIVER
113FORS1 801101 17010210 HQ
0000 FEET DEPTH

/TYPA/AMBNT/STREAM

INDEX
MILES

DATE FROM TO	TIME OF DAY	MEDIUM	SMK OR DEPTH (FT)	00065 STREAM STAGE FEET	00055 STREAM VELOCITY FT/SEC	00060 STREAM FLOW CFS	00076 TURB HACH FTU	80154 SUSP SED CONC MG/L	80225 BEDLOAD DISCHARG TONS/DAY	00665 PHOS-TOT MG/L P	00300 DO MG/L	00400 PH SU	00094 CNDUCTVY FIELD MICROMHO
86/01/15	1330	WATER		3.55	.6	25	1.1	9			11.2	6.80	32
86/01/18	1400	WATER		3.70			1.2	.5				6.80	33
86/01/24	1030	WATER		3.70	.7	31	1.4	1			12.4	6.85	32
86/01/30	1300	WATER		3.34	.7	22	.1	4				6.70	32
86/05/07	1330	WATER		4.01			.1	6		.020			30
86/05/15	1130	WATER		3.18	.6	23	.9	.5			6.8	6.80	19
86/05/21	1200	WATER		3.80	.7	30	1.5	5			12.2	6.80	36
86/05/29	1140	WATER		2.45	.3	6	1.7	3			9.2	6.80	39
86/06/04	1230	WATER		2.13	.3	3	1.3	3			10.8	7.00	44
86/06/11	1130	WATER		2.20	.2	4	1.0	.9			9.0	6.90	42
86/06/19	1015	WATER		2.26	.2	2	1.3	2			7.0	6.90	31
86/06/26	0915	WATER		2.71	.03	.3	1.4L	3			8.0	6.90	51
86/07/03	1130	WATER		2.63			1.2	2			8.4	6.90	51
86/07/10	0950	WATER		2.53	.01	.2	1.6	7			8.0	6.80	53
86/07/17	1000	WATER		2.50	.1	1	2.3	3			8.6	6.70	36
86/07/30		WATER		2.47	.01	.05	1.3	.7			8.2	6.80	33
86/08/12	1000	WATER		2.52			1.8	.3K			6.4	6.80	63
86/08/28	0945	WATER		2.77			1.1	2			6.8	6.70	54
86/09/08	1045	WATER		2.89			2.2	.3K			7.2	6.80	62

FL8020
48 16 45.0 114 46 25.0 3
SQUAW MEADOWS CR 22 MI SW WHITEFISH MT
30029 MONTANA FLATHEAD
PACIFIC NORTHWEST 130200
CLARK FORK-PEND OREILLE RIVER
113FORS1 801101 17010210 HQ
0000 FEET DEPTH

/TYPA/AMBNT/STREAM

INDEX
MILES

DATE FROM TO	TIME OF DAY	MEDIUM	SMK OR DEPTH (FT)	00011 WATER TEMP FAHN	00021 AIR TEMP FAHN	31616 FEC COLI MFM-FCBR /100ML	31673 FECSTREP MFKFAGAR /100ML
86/04/15	1330	WATER			50.0		
86/04/24	1030	WATER		31.0			
86/04/30	1300	WATER		32.0	39.0		
86/05/07	1330	WATER		37.0	56.0		
86/05/15	1130	WATER		34.0	44.0		
86/05/21	1200	WATER			45.0		
86/05/29	1140	WATER		58.0	72.0		
86/06/04	1230	WATER		58.0	56.0		
86/06/11	1130	WATER		54.0	74.0		
86/06/19	1015	WATER		52.0	47.0		
86/06/26	0915	WATER		60.0	70.0		
86/07/03	1130	WATER		61.0	64.0		
86/07/10	0950	WATER		44.0	50.0		
86/07/17	1000	WATER		51.0	50.0		
86/07/30		WATER		55.0	63.0		
86/08/12	1000	WATER		60.0	56.0		
86/08/28	0945	WATER		54.0	61.0		
86/09/09	1045	WATER		50.0	57.0		

FL8021
48 16 11 0 114 46 15.0 2
TRIB TO SQUAW MEADOWS C 23 MI SW WHITEFISH MT
30029 MONTANA FLATHEAD
PACIFIC NORTHWEST 130200
CLARK FORK-PEND OREILLE RIVER
113FORS1 820717 17010210 HQ
0000 FEET DEPTH

/TYPA/AMBNT/STREAM

INDEX
MILES

DATE FROM TO	TIME OF DAY	MEDIUM	SMK OR DEPTH (FT)	00065 STREAM STAGE FEET	00055 STREAM VELOCITY FT/SEC	00060 STREAM FLOW CFS	00076 TURB TRBIDMTR HACH FTU	80154 SUSP SED CONC MG/L	80225 BEDLOAD DISCHARG TONS/DAY	00665 PHOS-TOT MG/L P	00300 DO MG/L	00400 PH SU	00094 CNDUCTVY FIELD MICROMHO
86/04/18	1430	WATER		.47	.8	3	.7	.3		.013		6.70	31
86/04/24	0900	WATER		.62	1.2	6	.8	4	.00	.019	10.4	6.85	27
86/04/30	1400	WATER		.41	.9	3	.9	2	.00	.014		6.70	25
86/05/07	1415	WATER		.72	.9	6	.2	3	.00	.016			32
86/05/15	1300	WATER		.46	.7	3	.5	.6	.00	.013		6.80	25
86/05/21	1330	WATER		.65	1.0	6		.6	.00	.021	12.4	6.70	
86/05/29	1315	WATER		.30	.5	2	1.9	.5	.00	.013	10.0	6.70	30
86/06/04		WATER			1.0	.9	.6	.7	.00	.025	9.8	6.60	31
86/06/11	1315	WATER		.16	.3	.8	.7	2	.00	.013	9.0	6.90	32
86/06/19	1100	WATER		.12	.3	.5	.8	1	.00	.013	10.0	6.90	29
86/06/26	1100	WATER		.06	.01	.08	.7	2		.003	8.6	6.90	40
86/07/03	1230	WATER		.06		.08J	.6	2		.013	10.2	7.10	24
86/07/10	0845	WATER		.03	.05	.09	.7	5	.00	.020	9.6	7.00	43
86/07/17	1045	WATER		.02	.1	.3	.6	3		.015	9.0	6.80	42
86/07/30	1100	WATER								.014			
86/07/31	1100	WATER		.01	.02	.03	.6	.3			9.6	7.00	48
86/08/12		WATER			.2	.03	.6	.3K		.015	8.0	7.00	51
86/08/28	1030	WATER			.1	.02	.6	2		.012	7.6	6.70	57
86/09/05	1130	WATER		.02	.3	.09	.6	.3K			8.8	6.90	45
86/09/08	1130	WATER								.010			
86/10/22	1415	WATER		.05	.4	.1	1.4				10.2	6.80	45

FL8021
48 16 11 0 114 46 15.0 2
TRIB TO SQUAW MEADOWS C 23 MI SW WHITEFISH MT
30029 MONTANA FLATHEAD
PACIFIC NORTHWEST 130200
CLARK FORK-PEND OREILLE RIVER
113FORS1 820717 17010210 HQ
0000 FEET DEPTH

/TYPA/AMBNT/STREAM

INDEX
MILES

DATE FROM TO	TIME OF DAY	MEDIUM	SMK OR DEPTH (FT)	00011 WATER TEMP FAHN	00021 AIR TEMP FAHN	31616 FEC COLI MFM-FCBR /100ML	31673 FECSTREP MFKFAGAR /100ML
86/04/24	0900	WATER		32.0			
86/04/30	1400	WATER		33.0	37.0		
86/05/07	1415	WATER		34.0	48.0		
86/05/15	1300	WATER		32.0	37.0		
86/05/21	1330	WATER		40.0	44.0		
86/05/29	1315	WATER		42.0	68.0		
86/06/04		WATER		50.0	58.0		
86/06/11	1315	WATER		50.0	65.0		
86/06/19	1100	WATER		46.0	43.0		
86/06/26	1100	WATER		50.0	62.0		
86/07/03	1230	WATER		51.0	58.0		
86/07/10	0845	WATER		44.0	46.0		
86/07/17	1045	WATER		46.0	47.0		
86/07/31	1100	WATER		47.0	56.0		
86/08/12		WATER		50.0	58.0		
86/08/28	1030	WATER		50.0	50.0		
86/09/05	1130	WATER		45.0	51.0		
86/10/22	1415	WATER		33.0	46.0		

SECTION A

WATER QUALITY

Part III.

Water Quality Data collected by Montana Department of State Lands, Forestry Division, 2705 Spurgin Rd., Missoula, MT 59801.

I. Introduction

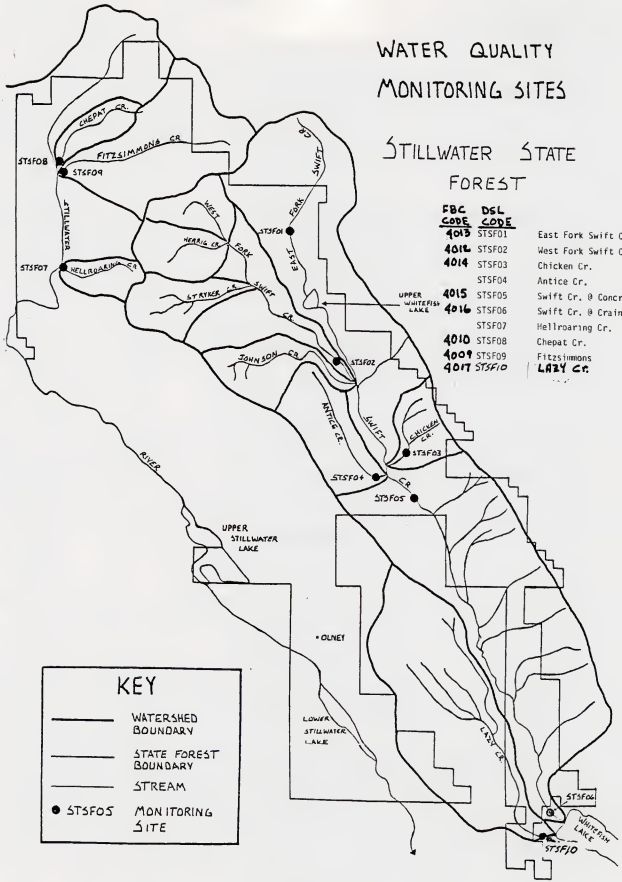
This report is based on "Surface Water Quality of the Stillwater State Forest and Swan River State Forest 1976-1983" (Schultz, 1984), as well as some preliminary statistical comparisons of data collected since 1983.

The Department of State Lands has collected 693 water quality samples at ten stations (eight of which are now active) on the Stillwater State Forest since monitoring started in 1976 (see map). The station on Lazy Creek (STSF10) is monitored in cooperation with Plum Creek Timber Company. Sampling is concentrated during periods of high flow. The number of samples per station average ten to twelve each year.

The data consists of basic chemical and physical parameters, including nutrient and sediment concentrations, as well as flow volumes. All samples and flow measurements, with exception of discharge at Crains Ranch 1976-1981, are instantaneous and represent only a point in time.

The Stillwater State Forest lies north of Whitefish between the Whitefish Range and the Stillwater River. It contains 90,000 acres of State-owned land. There is a total of 93 square miles of State, federal and private ownership upstream of the ten stations on the forest.

The size of drainage areas monitored, range from 1.8 to 78 square miles. Six of the active stations lie in the Swift Creek watershed, the principle tributary of Whitefish Lake. The other two active stations are in headwater tributaries of the Stillwater River. Two stations, Chepat and Chicken Creek


WATER QUALITY
MONITORING SITES
STILLWATER STATE
FOREST
FBC CODE
DSL CODE
4013 STSF01 East Fork Swift Cr.
4012 STSF02 West Fork Swift Cr.
4014 STSF03 Chicken Cr.
STSF04 Antice Cr.
4015 STSF05 Swift Cr. @ Concrete Bridge
4016 STSF06 Swift Cr. @ Crain's Ranch
STSF07 Hellroaring Cr.
4010 STSF08 Chepat Cr.
4009 STSF09 Fitzsimmons
4017 STSF10 LAZY CR.
KEY
WATERSHED BOUNDARY
STATE FOREST BOUNDARY
STREAM
STSF05 MONITORING SITE
CHEPAT CR.
FITZSIMMONS CR.
STSF08
STSF09
STILLAGUAMISH
STSF07
HELLROARING CR.
WEST FORK
HERRIG CR.
STSF01
EAST FORK SWIFT
SWIFT CR.
STRYKER CR.
UPPER WHITEFISH LAKE
JOHNSON CR.
STSF02
ANTICE CR.
SWIFT CR.
CHICKEN CR.
STSF03
STSF04
CR.
STSF05
RIVER
UPPER STILLWATER LAKE
OLNEY
LOWER STILLWATER LAKE
EASY CR.
STSF06
WHITEFISH LAKE
STSF10

are baseline stations. Neither have experienced forest management activity or other disturbance.

The upland areas are composed of glacial trough walls and glacial till. The bottom land is blanketed with a glacial outwash and drift. Valley bottoms contain alluvial and silty lake deposits. Bedrock types include pre-cambrian sedimentary rock of the Siyeh, Grinnell and Pregan formations, composed primarily of limestone and argillite.

II. Results

FLOW:

Streams mentioned in this report are all influenced by a runoff cycle fueled by spring snowmelt coupled with spring precipitation events in April, May and June. Streams peak on the average in the last week of May, and show at least a 50 fold increase between minimum and maximum flow within a year. The months of May and June account for about 60 percent of the annual flow volume.

The flow rate for most stations during baseflow is 0.2 to 0.5 cubic feet per second (cfs) per square mile (CSM). Flow rate at high flow ranges up to 30 CSM. Discharge at the upstream Swift Creek Station (STSF05) is nearly identical to the station ten miles downstream (STSF06). No additional streamflow results from the increase in drainage area between these two stations.

Peak runoff during 1986 was the highest value recorded for the period of record for the East Fork and West Fork of Swift Creek. Runoff was triggered

by an extended period of unseasonably warm weather. High runoff was attained even though snowpack was well below average and no precipitation occurred during the peak melt.

SUSPENDED SOLIDS:

Past trends in suspended solids data were substantiated by the 1986 data. Total suspended solid (TSS) yields at Swift Creek at Crains Ranch (STSF06) continue to be 10 to 20 times greater at high flows than the Swift Creek Station (STSF05) ten miles upstream. This is due to the large supply of sediment available from the mass-wasting in the lower reaches of the channel, where Swift Creek is undercutting glaciofluvial deposits.

Swift Creek at Crains (STSF06) is the only station to have TSS concentrations above 100 milligrams/liter. Eight of ninety-eight samples (less than 10%) taken since 1976 have TSS concentrations exceeding 100 milligrams/-liter. Linear regression analysis shows a good correlation between the logarithms of suspended sediment and discharge at this station.

DISSOLVED IONS:

Water in the Stillwater State Forest can be characterized as a calcium bicarbonate type. The source of the dissolved chemical constituents is primarily groundwater input from dissolution of the country rock. Major anions and cations are well within standards for high quality drinking water. Maximum nitrate concentrations are less than 0.5 mg/l, well below the 10 mg/l drinking water standards. With the exception of potassium and phosphates, most dissolved ions decreased in concentration with increasing discharge at all stations. This dilution effect was not generally observed

for phosphates or potassium. Concentrations of these species tended to increase with discharge.

Phosphate values in Swift Creek are of special interest because of the nutrient status of Whitefish Lake. Golnar and Stanford (1984) conducted a limnological study of Whitefish Lake. They classified the lake as oligomesotrophic and concluded that "additional nutrient loading that will further stimulate algal productivity must be prevented."

The total phosphorus and phosphate data show two values above 0.05 mg/l, both collected at Swift Creek at Crains Ranch (STSF06) during spring runoff. Total phosphorus concentrations correlate well with TSS concentrations for most stations, and are generally significant at the 95% confidence level. The data shows a greater than 300% increase in both total phosphate yields and concentrations between Swift Creek at Concrete Bridge (STSF05) and Swift Creek at Crains Ranch (STSF06). The high phosphate loads for Swift Creek at Crains Ranch are largely derived from the 8 - 10 miles of stream immediately above the station.

WATER TEMPERATURE:

Average water temperatures from 1976-1986 ranged from a low of 41°F (East Fork of Swift Creek, STSF01) to a high of 52°F (Lazy Creek, STSF10). Most stations within the Stillwater Forest averaged 41°F to 43°F. The highest measured water temperature, 64°F, was observed at Lazy Creek (STSF10).

All values were below the maximum value listed for the State Water Quality Standards (A-1), 67°F. The recorded values are within the range acceptable for cold water sportfish.

DISCUSSION/CONCLUSION:

For the parameters tested, the waters of the Stillwater State Forest appear to be highly suitable for domestic and irrigation use, recreation use and propagations of salmonid fisheries, with the exception of high TSS concentrations during peak flow at downstream stations.

Total suspended solid yields for upstream stations having the most direct impact from forest management activities are within range expected for near natural conditions.

The dominate factor affecting Swift Creek suspended sediment and phosphate contributions to Whitefish Lake is the erosive channel banks occurring in the lower ten miles of the drainage.

References

Golnar, T.F. and J.A. Stanford, 1984. Limnology of Whitefish Lake, Montana, University of Montana Biological Station, Bigfork, Montana, 72 p.

Schultz, B., 1984, Surface Water Quality of the Stillwater State Forest and Swan River State Forest 1976-1983, Department of State Lands, Forestry Division, Missoula, Montana, 55 p.

TABLE A. III. 1

STATION:EAST FK. SWIFT CR. STATION NUMBER:STSF01
DRAINAGE AREA: 7.6 SQ.MI.
LOCATION: SEC 17 T34N R17W STILLWATER STATE FOREST
****** DEFAULT VALUE OF -1 INDICATES NO DATA******

DATE	AIR TEMP (F)	WATER TEMP (F)	PH	DISCHG (CFS)	DISCHG CFS/MI2	STAGE (FT)	TSS MG/L	TSS TON/DAY	SPEC COND UMHOS/CM	HARD-NESS MG/L	ALKA-LINITY MG/L
04/20/83	42	37	7.1	13.9	1.8	0.66	0.6	0.02	111	51	86
05/10/83	40	36	6.9	37.0	4.9	0.92	5.0	0.58	158	86	120
06/08/83	67	42	7.4	178.9	23.5	1.52	2.9	1.40	125	86	86
06/21/83	64	44	7.2	77.5	10.2	1.22	2.7	0.56	132	68	94
07/12/83	59	45	7.6	48.5	6.4	1.02	1.8	0.24	146	86	120
08/04/83	87	49	7.9	25.7	3.4	0.84	1.4	0.10	150	103	103
08/16/83	-1	-1	-1.0	8.9	1.2	0.71	-1.0	-1.00	-1	-1	-1
09/07/83	63	44	7.5	10.1	1.3	0.56	0.7	0.02	155	103	86

STATION: EAST FK SWIFT STATION NUMBER: STSF01
DRAINAGE AREA: 7.6 SQ.MI.
LOCATION: SEC 17 T34N R17W STILLWATER STATE FOREST
******DEFAULT VALUE OF -1 INDICATES NO DATA******

DATE	PO4 TOTAL MG\L	PO4 TOT LB/D	PO4 ORTHO MG/L	PO4 ORTHO LB/D	NO3 MG/L	NO3 LB/D	CL ****	SO4 ****	CA ****	MG ****	NA MG/L	K ****	HCO3 ****	TDS ****
04/20/83	0.004	0.30	******	*****	0.199	14.94	0.07	1.6	14.2	5.2	0.9	0.1	69.0	92.0
05/10/83	0.001	0.20	******	*****	0.153	30.57	21.10	1.7	21.1	7.8	0.8	0.1	100.0	132.9
06/08/83	-1.000	-1.00	******	*****	-1.000	-1.00	-1.00	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
06/21/83	0.003	1.26	******	*****	0.077	32.22	0.04	1.5	18.4	5.6	0.7	0.1	85.4	112.4
07/12/83	0.004	1.05	******	*****	0.078	20.43	0.06	1.7	21.2	5.8	0.7	0.1	94.4	123.9
08/04/83	0.005	0.69	******	*****	0.077	10.69	0.13	1.6	20.0	7.1	0.8	0.2	97.3	127.5
08/16/83	-1.000	-1.00	******	*****	-1.000	-1.00	-1.00	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
09/07/83	0.003	0.16	******	*****	0.110	6.00	0.04	1.4	19.8	7.5	1.0	0.1	100.0	130.3

TABLE A. III. 2

STATION:WEST FK. SWIFT CR. STATION NUMBER:STSF02
DRAINAGE AREA: 20.2 SQ.MI.
LOCATION: SEC 34 T34N R23W STILLWATER STATE FOREST
****** DEFAULT VALUE OF -1 INDICATES NO DATA******

DATE	AIR TEMP (F)	WATER TEMP (F)	PH	DISCHG (CFS)	DISCHG CFS/MI2	STAGE (FT)	TSS MG/L	TSS TON/DAY	SPEC COND UMHOS/CM	HARD-NESS MG/L	ALKA-LINITY MG/L
04/20/83	50	41	7.5	12.5	0.6	6.30	1.8	0.06	175	103	103
05/10/83	42	38	7.1	42.2	2.1	5.75	1.5	0.17	175	103	120
05/25/83	70	59	7.4	226.0	11.2	4.70	15.7	9.58	147	86	103
06/08/83	62	41	-1.0	234.0	11.6	4.96	7.6	4.80	150	103	120
06/21/83	67	44	7.8	91.8	4.5	5.32	3.2	0.79	146	86	103
07/12/83	66	45	-1.0	51.0	2.5	5.63	2.1	0.29	170	120	120
08/04/83	84	54	-1.0	32.6	1.6	5.75	2.0	0.18	176	120	120
08/16/83	-1	-1	-1.0	26.2	1.3	5.88	-1.0	-1.00	-1	-1	-1
09/07/83	64	44	7.7	27.6	1.4	6.00	0.9	0.07	189	137	120

STATION: WEST FK SWIFT CR STATION NUMBER: STSF02
DRAINAGE AREA: 20.2 SQ.MI.
LOCATION: SEC 34 T34N R23W STILLWATER STATE FOREST
******DEFAULT VALUE OF -1 INDICATES NO DATA******

DATE	PO4 TOTAL MG\L	PO4 TOT LB/D	PO4 ORTHO MG/L	PO4 ORTHO LB/D	NO3 MG/L	NO3 LB/D	CL ****	SO4 ****	CA ****	MG ****	NA MG/L	K ****	HCO3 ****	TDS ****
04/20/83	0.005	0.34	******	-1.00	0.095	6.41	0.07	1.5	27.3	6.4	0.8	0.2	116.0	152.7
05/10/83	0.004	0.91	******	-1.00	0.106	24.16	0.05	1.6	27.9	6.4	0.7	0.1	116.7	154.4
05/25/83	0.014	17.09	******	-1.00	0.105	128.14	0.10	1.0	24.2	4.0	0.5	0.2	95.3	125.2
06/08/83	0.005	6.32	******	-1.00	0.070	88.45	0.18	1.0	22.0	5.0	0.5	0.2	93.3	121.8
06/21/83	0.003	1.49	******	-1.00	0.025	12.39	0.16	1.4	24.4	6.2	0.6	0.2	106 3	139.5
07/12/83	0.010	2.75	******	-1.00	0.040	11.02	0.20	1.4	27.6	5.8	0.6	0.1	114.3	150.0
08/04/83	0.005	0.88	******	-1.00	0.018	3.17	0.05	1.1	27.8	6.6	0.7	0.2	117.7	154.2
08/16/83	-1.000	-1.00	******	-1.00	-1.000	-1.00	-1.00	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
09/07/83	0.004	0.60	******	-1.00	0.027	4.62	0.03	1.5	27.7	6.9	0.8	0.1	122.7	159.8

TABLE A. III 3

STATION: CHICKEN CREEK STATION NUMBER: SISF03
DRAINAGE AREA: 2.5 SQ.MI.
LOCATION: SEC 14 T34N R23W STILLWATER STATE FOREST
****** DEFAULT VALUE OF -1 INDICATES NO DATA******

DATE	AIR TEMP (F)	WATER TEMP (F)	PH	DISCHG (CFS)	DISCHG CFS/MI2	STAGE (FT)	TSS MG/L	TSS TON/DAY	SPEC COND UMHOS/CM	HARD-NESS MG/L	ALKA-LINITY MG/L
04/20/83	60	39	6.5	2.6	1.0	1.30	3.7	0.03	42	17	34
05/10/83	54	39	7.3	9.1	3.6	1.34	0.0	0.00	39	17	34
05/25/83	72	42	6.2	20.5	8.0	1.55	10.6	0.59	31	17	51
06/08/83	68	43	6.5	15.1	5.9	1.43	1.5	0.06	34	34	51
06/21/83	58	42	6.4	9.4	3.7	1.34	1.2	0.03	40	58	42
07/12/83	44	56	-1.0	3.8	1.5	1.33	1.3	0.01	44	44	56
08/04/83	77	47	7.2	5.3	2.1	1.29	1.6	0.02	45	51	34
08/15/83	-1	-1	-1.0	3.8	1.5	1.26	-1.0	-1.00	-1	-1	-1
09/07/83	63	44	7.2	2.4	0.9	1.23	1.1	0.01	49	66	51

STATION: CHICKEN CREEK STATION NUMBER: SISF03
DRAINAGE AREA: 2.5 SQ.MI.
LOCATION: SEC 14 T34N R23W STILLWATER STATE FOREST
******DEFAULT VALUE OF -1 INDICATES NO DATA******

DATE	PO4 TOTAL MG\L	PO4 TOT LB/D	PO4 ORTHO MG/L	PO4 ORTHO LB/D	NO3 MG/L	NO3 LB/D	CL ****	SO4 ****	CA ****	MG ****	NA MG/L	K ****	HCO3 ****	TDS ****
04/20/83	0.019	0.27	******	-1.00	0.050	0.70	0.15	1.7	4.0	1.4	1.6	0.2	22.3	31.6
05/10/83	0.010	0.49	******	-1.00	0.013	0.64	0.01	1.8	3.9	1.3	1.4	0.1	20.1	28.8
05/25/83	0.016	1.77	******	-1.00	0.007	0.77	0.06	1.0	3.1	0.9	1.0	0.1	16.8	22.0
06/08/83	0.010	0.81	******	-1.00	0.006	0.65	0.05	1.4	3.9	1.1	1.1	0.1	19.0	55.4
06/21/83	0.008	0.41	******	-1.00	0.010	0.51	0.06	1.6	4.2	1.5	1.3	0.2	22.5	31.3
07/12/83	0.016	0.33	******	-1.00	0.007	0.14	0.80	1.7	5.2	1.5	1.2	0.1	24.1	34.6
08/04/83	0.011	0.32	******	-1.00	0.009	0.26	0.43	1.9	4.9	1.6	1.6	0.2	24.3	34.9
08/15/83	-1.000	-1.00	******	-1.00	-1.000	-1.00	-1.00	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
09/07/83	0.009	0.12	******	-1.00	0.012	0.16	0.13	2.0	4.8	1.8	1.7	0.2	26.1	36.7

TABLE A. III. 4

STATION:SWIFT CR @ CONC.BRIDGE STATION NUMBER:STSF05
DRAINAGE AREA: 50.6 SQ.MI.
LOCATION: SEC 24 T33N R23W STILLWATER STATE FOREST
****** DEFAULT VALUE OF -1 INDICATES NO DATA******

DATE	AIR TEMP (F)	WATER TEMP (F)	PH	DISCHG (CFS)	DISCHG CFS/MI2	STAGE (FT)	TSS MG/L	TSS TON/DAY	SPEC COND UMHOS/CM	HARD-NESS MG/L	ALKA-LINITY MG/L
04/20/83	64	42	7.1	78.8	1.6	10.32	5.3	1.13	135	86	86
05/10/83	50	42	7.8	222.0	4.4	9.47	4.4	2.76	142	103	103
05/25/83	69	43	7.3	658.0	13.0	8.37	24.4	43.35	124	86	86
06/08/83	56	43	7.3	532.0	10.5	8.52	12.8	18.39	125	86	86
06/21/83	58	43	7.4	280.0	5.5	9.17	5.0	3.78	147	68	103
07/12/83	61	46	-1.0	221.6	4.4	9.47	4.4	2.63	154	103	103
08/04/83	74	50	8.1	161.0	3.2	9.77	2.2	0.96	160	120	86
08/15/83	-1	-1	-1.0	89.7	1.8	9.97	-1.0	-1.00	-1	-1	-1
09/07/83	62	46	7.5	69.2	1.4	10.17	2.1	0.39	154	103	103

STATION: SWIFT @ CONC. BRIDGE STATION NUMBER: STSF05
DRAINAGE AREA: 50.6 SQ.MI.
LOCATION: SEC 24 T33N R23W STILLWATER STATE FOREST
******DEFAULT VALUE OF -1 INDICATES NO DATA******

DATE	PO4 TOTAL MG\L	PO4 TOT LB/D	PO4 ORTHO MG/L	PO4 ORTHO LB/D	NO3 MG/L	NO3 LB/D	CL ****	SO4 ****	CA ****	MG ****	NA MG/L	K ****	HCO3 ****	TDS ****
04/20/83	0.008	3.40	******	-1.00	0.063	26.81	0.15	1.2	19.7	4.6	0.9	0.2	83.3	116.4
05/10/83	0.007	8.39	******	-1.00	0.082	98.30	0.07	1.7	20.1	5.7	0.9	0.2	89.3	118.7
05/25/83	0.011	39.09	******	-1.00	0.083	294.92	0.10	1.4	19.9	3.7	0.7	0.2	80.7	107.4
06/08/83	0.006	17.24	******	-1.00	0.056	160.88	0.08	1.5	20.0	5.4	0.6	0.2	87.9	116.2
06/21/83	0.004	6.05	******	-1.00	0.059	89.21	0.06	1.8	21.8	5.7	0.8	0.2	95.1	125.9
07/12/83	0.006	7.18	******	-1.00	0.039	46.67	0.34	1.6	22.1	5.5	0.8	0.2	97.5	128.3
08/04/83	0.006	5.22	******	-1.00	0.037	32.17	0.03	1.5	23.8	6.2	0.8	0.2	103.0	135.6
08/15/83	-1.000	-1.00	******	-1.00	-1.000	-1.00	-1.00	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
09/07/83	0.004	1.50	******	-1.00	0.033	12.33	0.13	1.7	23.9	6.6	1.0	0.2	107.5	141.1

TABLE A.III.5

STATION: SWIFT CREEK AT CRAINS STATION NUMBER: STSF06
DRAINAGE AREA: 78.0 SQ.MI.
LOCATION: SEC 05 T31N R22W STILLWATER STATE FOREST
****** DEFAULT VALUE OF -1 INDICATES NO DATA******

DATE	AIR TEMP (F)	WATER TEMP (F)	PH	DISCHG (CFS)	DISCHG CFS/MI2	STAGE (FT)	TSS MG/L	TSS TON/DAY	SPEC COND UMHOS/CM	HARD-NESS MG/L	ALKA-LINITY MG/L
03/30/83	42	37	-1.0	66.9	0.9	1.67	20.8	3.76	147	86	86
04/19/83	55	44	7.2	114.3	1.5	1.91	22.1	6.82	120	86	103
05/09/83	-1	-1	-1.0	358.1	4.6	2.64	17.3	16.73	-1	-1	-1
05/10/83	54	42	7.4	324.5	4.2	2.54	13.3	11.65	128	68	86
05/25/83	80	46	7.5	789.0	10.1	3.45	200.1	426.27	118	68	86
06/08/83	74	50	7.7	604.0	7.7	3.20	61.8	100.78	130	86	103
06/21/83	64	45	7.4	328.0	4.2	2.56	15.7	13.90	141	86	103
07/12/83	66	49	7.9	205.1	2.6	2.20	5.6	3.10	134	120	120
08/04/83	93	63	7.8	127.1	1.6	1.98	5.0	1.72	157	86	103
08/17/83	-1	-1	-1.0	93.3	1.2	1.80	-1.0	-1.00	-1	-1	-1
09/07/83	62	54	7.8	66.3	0.8	1.66	1.5	0.27	162	120	103

STATION: SWIFT AT CRAINS STATION NUMBER: STSF06
DRAINAGE AREA: 78.0 SQ.MI.
LOCATION: SEC 05 T31N R22W STILLWATER STATE FOREST
******DEFAULT VALUE OF -1 INDICATES NO DATA******

DATE	PO4 TOTAL MG\L	PO4 TOT LB/D	PO4 ORTHO MG/L	PO4 ORTHO LB/D	NO3 MG/L	NO3 LB/D	CL ****	SO4 ****	CA ****	MG ****	NA MG/L	K ****	HCO3 ****	TDS ****
03/30/83	0.004	1.45	******	-1.00	0.655	19.87	0.16	1.7	18.8	5.0	1.3	0.3	84.2	111.7
04/19/83	0.023	14.20	******	-1.00	0.057	35.18	2.30	1.0	17.5	4.2	1.1	0.3	71.6	98.3
05/09/83	-1.000	-1.00	******	-1.00	-1.000	-1.00	-1.00	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
05/10/83	0.011	19.27	******	-1.00	0.043	75.35	0.13	1.5	18.6	4.9	1.0	0.3	81.9	108.7
05/25/83	0.040	170.42	******	-1.00	0.059	251.38	0.10	1.3	18.1	3.5	0.7	0.2	75.6	100.0
06/08/83	0.009	29.35	******	-1.00	0.056	182.65	0.07	1.4	19.2	5.1	0.7	0.2	85.1	112.3
06/21/83	0.005	8.86	******	-1.00	0.020	35.42	0.18	1.3	21.5	5.6	0.8	0.2	93.3	123.6
07/12/83	0.026	28.80	******	-1.00	0.012	13.29	0.10	1.5	23.0	5.5	0.8	0.2	96.7	126.8
08/04/83	0.007	4.80	******	-1.00	0.017	11.67	0.12	1.3	22.4	6.1	1.0	0.3	99.8	131.0
08/17/83	-1.000	-1.00	******	-1.00	-1.000	-1.00	-1.00	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
09/07/83	0.005	1.79	******	1.00	0.011	3.94	0.05	1.8	22.6	6.3	1.2	0.2	104.1	136.5

TABLE A. III.6

STATION: CHEPAT CREEK STATION NUMBER: STSF08
DRAINAGE AREA: 1.8 SQ.MI.
LOCATION: SEC 05 T34N R24W STILLWATER STATE FOREST
****** DEFAULT VALUE OF -1 INDICATES NO DATA******

DATE	AIR TEMP (F)	WATER TEMP (F)	PH	DISCHG (CFS)	DISCHG CFS/MI2	STAGE (FT)	TSS MG/L	TSS TON/DAY	SPEC COND UMHOS/CM	HARD-NESS MG/L	ALKA-LINITY MG/L
06/07/83	74	44	7.1	28.8	18.7	0.96	3.0	0.23	106	51	86
07/12/83	60	46	-1.0	7.7	4.3	0.58	0.8	0.02	123	68	86
08/04/83	56	46	7.4	6.9	3.8	0.52	1.8	0.03	126	103	86
09/07/83	53	45	7.1	1.3	0.7	0.42	0.4	0.00	135	103	86

STATION: CHEPAT CREEK STATION NUMBER: STSF08
DRAINAGE AREA: 1.8 SQ.MI.
LOCATION: SEC 05 T34N R24W STILLWATER STATE FOREST
******DEFAULT VALUE OF -1 INDICATES NO DATA******

DATE	PO4 TOTAL MG\L	PO4 TOT LB/D	PO4 ORTHO MG/L	PO4 ORTHO LB/D	NO3 MG/L	NO3 LB/D	CL	SO4	CA	MG	NA	K	HCO3	TDS
							****	****	****	****	MG/L	****	****	****
06/07/83	-1.000	-1.00	******	-1.00	-1.000	-1.00	-1.00	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
07/12/83	-1.000	-1.00	******	-1.00	-1.000	-1.00	-1.00	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
08/04/83	-1.000	-1.00	******	-1.00	-1.000	-1.00	-1.00	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
09/07/83	-1.000	-1.00	******	-1.00	-1.000	-1.00	-1.00	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0

TABLE A.III, 7

STATION:FITZSIMMONS CREEK STATION NUMBER:STSF09
DRAINAGE AREA: 11.3 SQ.MI.
LOCATION: SEC 05 T34N R24W STILLWATER STATE FOREST
****** DEFAULT VALUE OF -1 INDICATES NO DATA******

DATE	AIR TEMP (F)	WATER TEMP (F)	PH	DISCHG (CFS)	DISCHG CFS/MI2	STAGE (FT)	TSS MG/L	TSS TON/DAY	SPEC COND UMHOS/CM	HARD-NESS MG/L	ALKA-LINITY MG/L
06/07/83	74	43	7.8	147.1	13.0	1.22	3.6	1.43	120	68	103
07/12/83	60	46	-1.0	35.5	3.1	0.68	1.0	0.10	143	86	103
08/04/83	56	45	7.5	39.6	3.5	0.57	1.1	0.12	161	120	103
09/07/83	54	44	6.6	19.4	1.7	0.35	0.4	0.02	172	120	120

STATION: FITZSIMMONS CREEK STATION NUMBER: STSF09
DRAINAGE AREA: 11.3 SQ.MI.
LOCATION: SEC 05 T34N R24W STILLWATER STATE FOREST
******DEFAULT VALUE OF -1 INDICATES NO DATA******

DATE	PO4 TOTAL MG\L	PO4 TOT LB/D	PO4 ORTHO MG/L	PO4 ORTHO LB/D	NO3 MG/L	NO3 LB/D	CL ****	SO4 ****	CA ****	MG ****	NA MG/L	K ****	HCO3 ****	TDS ****
06/07/83	-1.000	-1.00	******	-1.00	-1.000	-1.00	-1.00	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
07/12/83	-1.000	-1.00	******	-1.00	-1.000	-1.00	-1.00	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
08/04/83	-1.000	-1.00	******	-1.00	-1.000	-1.00	-1.00	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
09/07/83	-1.000	-1.00	******	-1.00	-1.000	-1.00	-1.00	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0

TABLE A.III.8

STATION:EAST FK. SWIFT CR. STATION NUMBER:STSF01
DRAINAGE AREA: 7.6 SQ.MI.
LOCATION: SEC 17 T34N R17W STILLWATER STATE FOREST
****** DEFAULT VALUE OF -1 INDICATES NO DATA******

DATE	AIR TEMP (F)	WATER TEMP (F)	PH	DISCHG (CFS)	DISCHG CFS/MI2	STAGE (FT)	TSS MG/L	TSS TON/DAY	SPEC COND UMHOS/CM	HARD- NESS MG/L	ALKA- LINITY MG/L
05/04/84	40	36	8.1	15.4	2.0	0.76	1.0	0.04	155	86	103
05/24/84	44	38	8.1	61.0	8.0	1.16	1.7	0.28	93	86	86
05/31/84	64	41	7.9	131.3	17.3	1.48	34.0	12.05	-1	103	103
06/08/84	47	37	8.2	100.9	13.3	1.34	2.4	0.65	-1	120	86
06/21/84	48	39	8.0	128.9	17.0	1.45	4.7	1.64	111	103	86
07/18/84	56	42	8.1	21.0	2.8	0.87	1.4	0.08	153	103	103
08/21/84	68	50	8.2	6.5	1.1	0.53	0.7	0.02	165	120	120
09/27/84	45	40	8.2	4.4	0.6	0.44	-1.0	-1.00	168	137	103

STATION: EAST FK SWIFT STATION NUMBER: STSF01
DRAINAGE AREA: 7.6 SQ.MI.
LOCATION: SEC 17 T34N R17W STILLWATER STATE FOREST
******DEFAULT VALUE OF -1 INDICATES NO DATA******

DATE	PO4 TOTAL MG\L	PO4 TOT LB/D	PO4 ORTHO MG/L	PO4 ORTHO LB/D	NO3 MG/L	NO3 LB/D	CL ****	SO4 ****	CA ****	MG ****	NA MG/L	K ****	HCO3 ****	TDS ****
05/04/84	0.004	0.33	******	*****	0.206	17.13	0.66	1.7	20.1	7.7	0.9	0.2	100.9	132.5
05/24/84	0.003	0.99	******	*****	0.162	53.36	0.26	1.5	18.0	6.8	0.8	0.2	90.0	118.3
05/31/84	0.024	17.02	******	*****	0.187	132.59	0.44	1.0	16.2	5.5	0.7	0.2	78.7	101.8
06/08/84	0.004	2.18	******	*****	0.117	63.75	0.09	1.4	17.5	5.6	0.6	0.2	81.8	107.7
06/21/84	0.005	3.48	******	*****	0.063	43.85	0.12	1.2	15.3	5.2	0.6	0.2	72.8	95.7
07/18/84	0.005	0.57	******	*****	0.019	2.15	0.07	1.4	20.6	6.9	0.9	0.2	99.2	129.3
08/21/84	0.004	0.19	******	*****	0.099	4.60	0.01	1.7	20.6	7.2	1.0	0.2	100.2	131.3
09/27/84	0.002	0.05	******	*****	0.103	2.45	0.08	1.6	19.5	7.5	1.0	0.2	98.8	129.1

TABLE A III.9

STATION:WEST FK. SWIFT CR. STATION NUMBER:STSF02
DRAINAGE AREA: 20.2 SQ.MI.
LOCATION: SEC 34 T34N R23W STILLWATER STATE FOREST
****** DEFAULT VALUE OF -1 INDICATES NO DATA******

DATE	AIR TEMP (F)	WATER TEMP (F)	PH	DISCHG (CFS)	DISCHG CFS/MI2	STAGE (FT)	TSS MG/L	TSS TON/DAY	SPEC COND UMHOS/CM	HARD-NESS MG/L	ALKA-LINITY MG/L
05/04/84	42	36	8.2	26.0	1.3	6.90	0.1	0.01	182	86	120
05/17/84	52	43	8.2	83.4	4.1	5.40	3.3	0.74	168	120	120
05/24/84	42	39	8.2	83.3	4.1	5.25	2.6	0.58	165	120	120
05/31/84	73	41	7.9	186.3	9.2	5.05	28.1	14.13	-1	103	120
06/07/84	51	41	8.2	144.4	7.1	5.10	4.7	1.83	-1	137	103
06/21/84	45	40	8.1	192.6	9.5	4.88	2.1	1.09	139	120	86
07/18/84	62	43	8.2	42.6	2.1	5.67	1.5	0.17	170	120	120
08/21/84	80	52	8.3	17.0	0.8	6.00	1.0	0.05	184	120	137
09/27/84	39	37	8.3	12.6	0.6	6.75	1.1	0.04	192	137	120

STATION: WEST FK SWIFT CR STATION NUMBER: STSF02
DRAINAGE AREA: 20.2 SQ.MI.
LOCATION. SEC 34 T34N R23W STILLWATER STATE FOREST
******DEFAULT VALUE OF -1 INDICATES NO DATA******

DATE	PO4 TOTAL MG\L	PO4 TOT LB/D	PO4 ORTHO MG/L	PO4 ORTHO LB/D	NO3 MG/L	NO3 LB/D	CL ****	SO4 ****	CA ****	MG ****	NA MG/L	K ****	HCO3 ****	TDS ****
05/04/84	0.004	0.56	******	-1.00	0.132	18.53	0.62	1.6	28.0	7.2	0.8	0.2	120.0	158.9
05/17/84	0.007	3.15	******	-1.00	0.117	52.69	0.19	1.3	25.5	6.0	0.8	0.2	108.8	143.3
05/24/84	0.005	2.25	******	-1.00	0.108	48.58	0.11	1.3	25.8	5.8	0.7	0.2	108.4	142.7
05/31/84	0.018	18.11	******	-1.00	0.102	102.61	1.34	1.0	21.0	5.2	0.6	0.2	92.2	121.9
06/07/84	0.005	3.90	******	-1.00	0.065	50.68	0.10	1.1	23.4	5.3	0.6	0.2	100.0	131.0
06/21/84	0.010	10.37	******	-1.00	0.034	35.25	0.09	1.0	21.0	4.6	0.6	0.2	89.2	115.8
07/18/84	0.007	1.61	******	-1.00	0.038	8.74	0.08	1.1	26.7	6.5	0.8	0.2	115.8	151.0
08/21/84	0.002	0.18	******	-1.00	0.027	2.48	0.12	1.3	27.9	6.9	0.9	0.2	121.4	158.8
09/27/84	0.002	0.14	******	-1.00	0.028	1.91	0.06	1.2	27.9	7.1	0.8	0.2	123.2	160.0

TABLE A. III. 10

STATION: CHICKEN CREEK STATION NUMBER: STSF03
DRAINAGE AREA: 2.5 SQ.MI.
LOCATION: SEC 14 T34N R23W STILLWATER STATE FOREST
****** DEFAULT VALUE OF -1 INDICATES NO DATA******

DATE	AIR TEMP (F)	WATER TEMP (F)	PH	DISCHG (CFS)	DISCHG CFS/MI2	STAGE (FT)	TSS MG/L	TSS TON/DAY	SPEC COND UMHOS/CM	HARD-NESS MG/L	ALKA-LINITY MG/L
05/04/84	43	37	7.4	4.6	1.8	1.32	1.7	0.02	46	17	34
05/17/84	49	40	7.4	14.4	5.7	1.38	2.5	0.10	36	68	51
05/24/84	39	39	7.4	12.0	4.7	1.39	0.0	0.03	37	68	51
05/31/84	68	43	7.2	20.5	8.0	1.48	8.3	0.46	-1	51	51
06/07/84	54	41	7.5	18.8	7.4	1.41	1.2	0.06	-1	68	51
06/21/84	43	40	7.3	21.6	8.5	1.51	4.7	0.27	76	68	51
07/18/84	69	42	7.6	5.3	2.1	1.32	0.4	0.01	46	51	68
08/21/84	86	47	7.6	2.5	1.0	1.22	0.4	0.00	47	51	51
09/26/84	39	39	7.5	1.8	0.7	1.25	6.6	0.03	46	103	51

STATION: CHICKEN CREEK STATION NUMBER: STSF03
DRAINAGE AREA: 2.5 SQ.MI.
LOCATION: SEC 14 T34N R23W STILLWATER STATE FOREST
******DEFAULT VALUE OF -1 INDICATES NO DATA******

DATE	PO4 TOTAL MG\L	PO4 TOT LB/D	PO4 ORTHO MG/L	PO4 ORTHO LB/D	NO3 NG/L	NO3 LB/D	CL ****	SO4 ****	CA ****	MG ****	NA MG/L	K ****	HCO3 ****	TDS ****
05/04/84	0.012	0.30	******	-1.00	0.034	0.84	0.27	2.1	3.8	1.5	1.5	0.2	21.6	31.0
05/17/84	0.011	0.85	******	-1.00	0.003	0.23	0.12	1.9	3.5	1.4	1.3	0.2	18.8	27.2
05/24/84	0.009	0.58	******	-1.00	0.014	0.91	0.24	1.4	3.6	1.4	1.3	0.2	19.4	27.5
05/31/84	0.013	1.44	******	-1.00	0.016	1.77	0.65	1.0	3.2	1.1	1.2	0.1	16.8	23.2
06/07/84	0.008	0.81	******	-1.00	0.006	0.61	0.07	1.4	3.7	1.2	1.2	0.2	19.0	26.8
06/21/84	0.012	1.40	******	-1.00	0.008	0.93	0.20	1.0	3.3	1.1	1.3	0.2	18.2	24.3
07/18/84	0.011	0.32	******	-1.00	0.013	0.37	0.03	1.5	4.2	1.7	1.4	0.2	24.6	33.6
08/21/84	0.008	0.11	******	-1.00	0.009	0.12	0.09	1.7	4.3	1.6	1.6	0.2	23.6	33.1
09/26/84	0.007	0.07	******	-1.00	0.003	0.03	0.13	1.9	3.6	1.9	1.9	0.2	23.6	33.2

TABLE A.III.11

STATION:SWIFT CR @ CONC.BRIDGE STATION NUMBER:STSF05
DRAINAGE AREA: 50.6 SQ.MI.
LOCATION: SEC 24 T33N R23W STILLWATER STATE FOREST
****** DEFAULT VALUE OF -1 INDICATES NO DATA******

DATE	AIR TEMP (F)	WATER TEMP (F)	PH	DISCHG (CFS)	DISCHG CFS/MI2	STAGE (FT)	TSS MG/L	TSS TON/DAY	SPEC COND UMHOS/CM	HARD-NESS MG/L	ALKA-LINITY MG/L
05/04/84	44	39	8.2	172.5	3.4	9.67	3.0	1.40	148	86	154
05/10/84	45	42	8.2	186.4	3.7	9.57	4.3	2.16	145	103	103
05/17/84	52	44	8.1	373.2	7.4	9.10	9.2	9.27	134	103	103
05/24/84	39	42	8.0	382.6	7.6	9.05	7.4	7.64	140	103	86
05/31/84	61	46	8.0	535.5	10.6	8.67	30.5	44.10	-1	103	103
06/07/84	61	44	8.2	455.4	9.0	8.77	6.1	7.50	-1	86	86
06/21/84	43	43	8.1	541.6	10.7	8.39	23.1	33.70	134	103	86
07/18/84	66	47	8.2	126.6	2.5	9.85	1.9	0.65	159	137	103
08/21/84	86	50	8.3	64.9	1.3	10.22	1.3	0.23	167	120	120
09/27/84	31	38	8.2	48.0	0.9	10.48	2.6	0.34	173	154	120

STATION: SWIFT @ CONC. BRIDGE STATION NUMBER: STSF05
DRAINAGE AREA: 50.6 SQ.MI.
LOCATION: SEC 24 T33N R23W STILLWATER STATE FOREST
******DEFAULT VALUE OF -1 INDICATES NO DATA******

DATE	PO4 TOTAL MG/L	PO4 TOT LB/D	PO4 ORTHO MG/L	PO4 ORTHO LB/D	NO3 MG/L	NO3 LB/D	CL ****	SO4 ****	CA ****	MG ****	NA MG/L	K ****	HCO3 ****	TDS ****
05/04/84	0.003	2.79	******	-1.00	0.096	89.42	0.28	1.7	21.2	5.4	0.9	0.2	93.2	123.3
05/10/84	0.004	4.03	******	-1.00	0.079	79.52	0.18	1.8	20.9	5.6	0.9	0.2	92.3	122.2
05/17/84	0.011	22.17	******	-1.00	0.083	167.27	0.13	1.4	19.1	5.1	0.9	0.3	85.8	113.0
05/24/84	0.006	12.40	******	-1.00	0.083	171.48	0.36	1.4	19.8	5.6	0.9	0.2	89.0	117.6
05/31/84	0.018	52.05	******	-1.00	0.089	257.36	0.12	1.3	18.6	5.2	0.9	0.2	84.4	111.3
06/07/84	0.005	12.30	******	-1.00	0.071	174.60	0.12	1.4	20.2	5.2	0.9	0.2	89.8	118.1
06/21/84	0.013	38.02	******	-1.00	0.047	137.46	0.33	0.9	17.9	4.8	0.8	0.2	80.5	106.6
07/18/84	0.005	3.42	******	-1.00	0.045	30.76	0.07	1.4	22.7	6.0	0.9	0.2	100.8	132.3
08/21/84	0.002	0.70	******	-1.00	0.046	14.92	0.03	1.3	23.1	6.7	1.0	0.2	106.0	138.3
09/27/84	0.002	0.52	******	-1.00	0.040	10.37	0.10	1.5	23.4	6.6	1.0	0.2	106.6	137.6

TABLE A.III. 12

STATION: SWIFT CREEK AT CRAINS STATION NUMBER: STSF06
DRAINAGE AREA: 78.0 SQ.MI.
LOCATION: SEC 05 T3IN R22W STILLWATER STATE FOREST
****** DEFAULT VALUE OF -1 INDICATES NO DATA******

DATE	AIR TEMP (F)	WATER TEMP (F)	PH	DISCHG (CFS)	DISCHG CFS/MI2	STAGE (FT)	TSS MG/L	TSS TON/DAY	SPEC COND UMHOS/CM	HARD-NESS MG/L	ALKA-LINITY MG/L
04/13/84	58	38	8.0	69.4	0.9	1.62	7.7	1.44	137	60	86
05/04/84	48	44	8.1	184.9	2.4	2.12	3.3	1.65	133	86	86
05/10/84	52	45	8.2	183.3	2.4	2.12	6.6	3.27	138	86	86
05/18/84	51	41	8.0	444.4	5.7	2.68	38.3	45.95	123	86	86
05/24/84	49	.41	8.0	412.1	5.3	2.62	18.5	20.58	131	103	103
05/31/84	54	45	7.9	654.5	8.4	3.16	194.1	343.00	-1	103	103
06/08/84	61	43	8.1	485.1	6.2	2.96	29.8	39.03	-1	103	103
06/22/84	57	45	8.1	568.0	7.3	3.14	61.8	94.78	133	103	86
07/18/84	74	56	8.2	130.9	1.7	1.82	5.0	1.77	154	103	120
08/23/84	60	60	8.3	55.5	0.7	1.48	2.2	0.33	165	103	103
09/26/84	41	44	8.2	42.6	0.6	1.40	1.8	0.21	161	154	120

STATION: SWIFT AT CRAINS STATION NUMBER: STSF06
DRAINAGE AREA: 78.0 SQ.MI.
LOCATION: SEC 05 T3IN R22W STILLWATER STATE FOREST
******DEFAULT VALUE OF -1 INDICATES NO DATA******

DATE	PO4 TOTAL MG\L	PO4 TOT LB/D	PO4 ORTHO MG/L	PO4 ORTHO LB/D	NO3 MG/L	NO3 LB/D	CL ****	SO4 ****	CA ****	MG ****	NA MG/L	K ****	HCO3 ****	TDS ****
04/13/84	0.005	1.87	******	-1.00	0.052	19.49	0.38	1.5	19.3	5.2	1.2	0.3	86.4	114.5
05/04/84	0.008	7.99	******	-1.00	0.052	51.92	0.17	1.9	18.9	4.9	1.0	0.3	83.7	111.1
05/10/84	0.005	4.95	******	-1.00	0.037	36.62	0.11	1.8	19.0	5.2	1.0	0.2	86.0	111.7
05/18/84	0.024	57.59	******	-1.00	0.070	167.98	0.13	1.5	17.4	4.9	1.0	0.3	78.4	103.8
05/24/84	0.006	13.35	******	-1.00	0.072	160.22	0.26	1.4	18.2	5.2	1.0	0.2	83.8	110.1
05/31/84	0.059	208.52	******	-1.00	0.082	289.81	0.33	1.2	16.7	4.8	0.9	0.2	76.2	100.6
06/08/84	0.013	34.05	******	-1.00	0.056	146.69	0.12	1.4	18.5	5.1	0.9	0.2	83.6	110.1
06/22/84	0.026	85.88	******	-1.00	0.032	98.15	0.10	0.9	17.3	4.8	0.8	0.2	77.8	102.0
07/18/84	0.007	4.95	******	-1.00	0.006	4.24	0.04	1.4	21.6	6.0	1.0	0.2	97.4	127.6
08/23/84	0.004	1.20	******	-1.00	0.024	7.19	0.03	1.3	21.8	6.6	1.2	0.2	102.4	133.6
09/26/84	0.002	0.46	******	-1.00	0.006	1.38	0.14	1.4	21.9	6.5	1.2	0.3	106.6	139.6

TABLE A.III 13

STATION: CHEPAT CREEK STATION NUMBER: STSF08
DRAINAGE AREA: 1.8 SQ.MI.
LOCATION: SEC 05 T34N R24W STILLWATER STATE FOREST
****** DEFAULT VALUE OF -1 INDICATES NO DATA******

DATE	AIR TEMP (F)	WATER TEMP (F)	PH	DISCHG (CFS)	DISCHG CFS/MI2	STAGE (FT)	TSS MG/L	TSS TON/DAY	SPEC COND UMHOS/CM	HARD-NESS MG/L	ALKA-LINITY MG/L
05/03/84	39	36	8.0	2.2	1.2	0.50	1.5	0.01	110	66	68
05/10/84	52	35	8.0	3.5	2.0	0.52	2.1	0.02	94	86	68
05/17/84	53	38	7.9	12.3	6.9	0.77	4.7	0.16	90	86	86
05/24/84	38	37	7.9	13.9	7.8	0.80	1.7	0.06	116	103	86
05/31/84	41	36	7.9	36.9	20.7	0.96	9.3	0.93	-1	103	68
06/07/84	51	41	7.9	15.0	8.4	0.76	5.7	0.23	-1	103	86
06/22/84	44	38	8.0	18.8	10.6	0.81	1.7	0.09	103	86	103
07/17/84	79	49	8.1	2.3	1.3	0.42	1.1	0.01	-1	86	86
08/23/84	49	48	8.1	0.8	0.4	0.32	0.7	0.00	137	103	103
09/26/84	42	37	8.0	0.5	0.3	0.31	2.7	0.00	137	137	120

STATION: CHEPAT CREEK STATION NUMBER: STSF08
DRAINAGE AREA: 1.8 SQ.MI.
LOCATION: SEC 05 T34N R24W STILLWATER STATE FOREST
******DEFAULT VALUE OF -1 INDICATES NO DATA******

DATE	PO4 TOTAL MG\L	PO4 TOT LB/D	PO4 ORTHO MG/L	PO4 ORTHO LB/D	NO3 MG/L	NO3 LB/D	CL ****	SO4 ****	CA ****	MG ****	NA MG/L	K ****	HCO3 ****	TDS ****
05/03/84	0.003	0.04	******	-1.00	0.005	0.06	0.05	1.3	15.1	4.3	0.9	0.2	70.8	92.6
05/10/84	0.003	0.06	******	-1.00	0.001	0.02	0.06	1.0	13.9	3.7	0.8	0.2	63.3	82.0
05/17/84	0.006	0.40	******	-1.00	0.004	0.27	0.07	1.0	12.8	3.6	0.7	0.2	57.8	75.2
05/24/84	0.005	0.38	******	-1.00	0.007	0.53	0.19	1.0	12.9	3.5	0.7	0.1	58.0	75.4
05/31/84	0.012	2.39	******	-1.00	0.007	1.39	0.68	1.0	12.6	3.5	0.7	0.1	55.2	72.5
06/07/84	0.003	0.24	******	-1.00	0.004	0.32	0.39	1.0	14.3	4.1	0.7	0.2	65.8	85.5
06/22/84	0.004	0.41	******	-1.00	0.004	0.41	0.03	1.0	16.1	4.4	0.6	0.2	73.4	94.7
07/17/84	0.007	0.09	******	-1.00	0.011	0.14	0.06	1.0	17.5	4.7	0.8	0.2	80.2	103.5
08/23/84	0.004	0.02	******	-1.00	0.007	0.03	0.05	1.0	18.1	5.2	1.0	0.2	85.2	109.7
09/26/84	0.002	0.01	******	-1.00	0.001	0.00	0.11	1.2	18.0	5.2	0.9	0.2	82.6	106.2

TABLE A.III 14

STATION:FITZSIMMONS CREEK STATION NUMBER:STSF09
DRAINAGE AREA: 11.3 SQ.MI.
LOCATION: SEC 05 T34N R24W STILLWATER STATE FOREST
****** DEFAULT VALUE OF -1 INDICATES NO DATA******

DATE	AIR TEMP (F)	WATER TEMP (F)	PH	DISCHG (CFS)	DISCHG CFS/MI2	STAGE (FT)	TSS MG/L	TSS TON/DAY	SPEC COND UMHOS/CM	HARD- NESS MG/L	ALKA- LINITY MG/L
05/04/84	39	38	8.0	19.7	1.7	0.50	1.4	0.07	145	103	103
05/10/84	45	37	8.1	27.1	2.4	0.53	0.6	0.04	133	103	103
05/17/84	56	41	8.0	58.1	5.1	0.84	1.3	0.20	125	86	103
05/24/84	48	39	8.1	57.2	5.1	0.87	3.4	0.53	133	103	86
05/31/84	46	37	7.9	171.5	15.2	1.32	12.8	5.93	-1	120	86
06/07/84	45	42	8.1	117.5	10.4	0.96	1.3	0.41	-1	120	86
06/22/84	46	39	8.1	134.8	11.9	1.14	2.7	0.98	127	103	86
07/17/84	75	51	8.3	34.8	3.1	0.57	1.0	0.09	-1	120	137
08/23/84	52	46	8.2	11.8	1.0	0.27	0.4	0.01	171	120	103
09/26/84	40	40	8.2	7.7	0.7	0.20	0.7	0.01	167	137	103

STATION: FITZSIMMONS CREEK STATION NUMBER: STSF09
DRAINAGE AREA: 11.3 SQ.MI.
LOCATION: SEC 05 T34N R24W STILLWATER STATE FOREST
******DEFAULT VALUE OF -1 INDICATES NO DATA******

DATE	PO4 TOTAL MG/L	PO4 TOT LB/D	PO4 ORTHO MG/L	PO4 ORTHO LB/D	NO3 MG/L	NO3 LB/D	CL ****	SO4 ****	CA ****	MG ****	NA MG/L	K ****	HCO3 ****	TDS ****
05/04/84	0.004	0.43	******	-1.00	0.027	2.87	0.24	1.5	20.2	5.7	1.0	0.2	92.5	121.3
05/10/84	0.007	1.02	******	-1.00	0.025	3.66	0.19	0.9	17.3	5.2	0.8	0.2	81.4	106.2
05/17/84	0.007	2.20	******	-1.00	0.025	7.84	0.19	0.9	17.3	5.2	0.8	0.2	81.4	106.2
05/24/84	0.003	0.93	******	-1.00	0.016	4.94	0.22	1.0	17.5	5.3	0.8	0.2	81.8	106.5
05/31/84	0.008	7.41	******	-1.00	0.018	16.67	0.24	1.0	15.8	4.4	0.6	0.2	71.4	93.1
06/07/84	0.003	1.90	******	-1.00	0.008	5.06	0.31	1.0	16.6	5.2	0.7	0.2	84.0	110.0
06/22/84	0.004	2.91	******	-1.00	0.007	5.10	0.03	1.0	17.3	4.6	0.7	0.2	78.6	101.5
07/17/84	0.005	0.94	******	-1.00	0.010	1.88	0.03	1.3	22.9	6.3	0.9	0.2	100.2	131.9
08/23/84	0.001	0.06	******	-1.00	0.008	0.51	0.02	1.1	22.8	6.8	1.1	0.2	107.6	139.6
09/26/84	0.001	0.04	******	-1.00	0.002	0.08	0.08	1.4	22.1	6.8	1.1	0.2	104.0	135.7

TABLE A III. 15

STATION:EAST FK. SWIFT CR. STATION NUMBER:STSF01
DRAINAGE AREA: 7.6 SQ.MI.
LOCATION: SEC 17 T34N R17W STILLWATER STATE FOREST
****** DEFAULT VALUE OF -1 INDICATES NO DATA******

DATE	AIR TEMP (F)	WATER TEMP (F)	PH	DISCHG (CFS)	DISCHG CFS/MI2	STAGE (FT)	TSS MG/L	TSS TON/DAY	SPEC COND UMHOS/CM	HARD-NESS MG/L	ALKA-LINITY MG/L
04/18/85	45	34	7.9	29.6	3.9	0.93	10.1	0.81	143	86	103
05/01/85	44	35	8.0	48.5	6.4	1.02	4.3	0.56	133	68	86
05/09/85	38	35	8.0	48.5	6.4	1.10	1.9	0.25	147	120	103
05/22/85	50	36	7.8	217.1	28.6	1.64	16.2	9.50	120	103	86
05/29/85	59	39	8.0	135.4	17.8	1.51	3.7	1.35	128	103	86
06/05/85	57	39	8.0	108.1	14.6	1.42	1.8	0.53	124	120	86
06/13/85	62	40	8.0	109.0	14.3	1.39	1.8	0.53	-1	120	103
06/27/85	59	40	8.2	38.5	5.1	1.07	2.1	0.22	146	103	103
07/25/85	64	44	8.1	18.8	2.5	0.71	0.9	0.05	160	103	103
08/20/85	49	43	8.0	6.6	0.9	0.56	1.0	0.02	163	103	103
10/03/85	41	38	8.1	12.6	1.7	0.61	1.0	0.03	157	103	103

STATION: EAST FK SWIFT STATION NUMBER: STSF01
DRAINAGE AREA: 7.6 SQ.MI.
LOCATION: SEC 17 T34N R17W STILLWATER STATE FOREST
******DEFAULT VALUE OF -1 INDICATES NO DATA******

DATE	PO4 TOTAL MG\L	PO4 TOT LB/D	PO4 ORTHO MG/L	PO4 ORTHO LB/D	NO3 MG/L	NO3 LB/D	CL ****	SO4 ****	CA ****	MG ****	NA MG/L	K ****	HCO3 ****	TDS ****
04/18/85	-1.000	-1.00	0.0010	0.160	0.210	33.57	0.10	2.0	16.5	6.3	0.9	0.2	84.5	111.6
05/01/85	0.008	2.10	0.0020	0.524	0.150	39.29	0.08	1.5	15.8	5.8	0.8	0.2	77.6	102.5
05/09/85	0.006	1.57	0.0010	0.262	0.174	45.57	0.10	1.6	18.1	6.5	0.8	0.2	88.6	116.7
05/22/85	0.013	15.24	0.0020	2.345	0.207	242.67	0.11	1.6	15.1	5.0	0.7	0.2	71.2	94.8
05/29/85	0.007	5.12	0.0020	1.462	0.100	73.12	0.09	1.4	15.3	5.5	0.6	0.2	74.2	97.7
06/05/85	0.004	2.33	0.0020	1.167	0.072	42.03	0.16	1.2	15.1	5.7	0.6	0.2	74.8	98.1
06/13/85	0.003	1.77	0.0010	0.589	0.079	46.50	0.05	1.3	14.9	5.9	0.7	0.2	75.6	98.7
06/27/85	0.002	0.42	0.0010	0.208	0.086	17.88	0.09	1.4	18.4	6.6	0.8	0.1	89.6	117.1
07/25/85	0.002	0.20	0.0010	0.102	0.098	9.95	0.22	1.8	21.2	6.8	0.9	0.2	98.6	129.5
08/20/85	0.002	0.07	0.0020	0.071	0.109	3.88	0.08	1.7	19.6	7.4	1.0	0.2	98.2	128.6
10/03/85	0.002	0.14	0.0010	0.068	0.095	6.46	0.10	2.1	19.5	7.2	1.0	0.2	96.2	125.6

TABLE A.III-16

STATION: WEST FK. SWIFT CR. STATION NUMBER: STSF02
DRAINAGE AREA: 20.2 SQ.MI.
LOCATION: SEC 34 T34N R23W STILLWATER STATE FOREST
****** DEFAULT VALUE OF -1 INDICATES NO DATA******

DATE	AIR TEMP (F)	WATER TEMP (F)	PH	DISCHG (CFS)	DISCHG CFS/MI2	STAGE (FT)	TSS MG/L	TSS TON/DAY	SPEC COND UMHOS/CM	HARD-NESS MG/L	ALKA-LINITY MG/L
04/18/85	46	37	8.0	38.1	1.9	5.80	2.3	0.24	177	137	120
05/01/85	51	37	8.1	57.0	2.8	5.58	7.5	1.15	173	120	120
05/09/85	45	36	8.1	72.8	3.6	5.29	2.3	0.45	171	120	120
05/15/85	55	38	8.1	104.8	5.2	5.25	2.4	0.68	164	103	120
05/22/85	60	38	8.0	286.1	14.1	4.75	35.5	27.42	148	103	86
05/29/85	59	40	8.1	157.6	7.8	5.04	6.9	2.94	150	103	103
06/05/85	50	41	8.1	135.7	6.7	5.08	5.7	2.09	157	103	137
06/13/85	64	41	8.2	104.8	5.2	5.25	3.5	0.99	-1	154	103
06/27/85	80	45	8.3	47.7	2.4	5.54	6.3	0.81	176	120	120
07/25/85	62	44	8.3	31.0	1.5	5.93	1.4	0.12	185	137	120
08/20/85	47	43	8.3	24.2	1.2	6.08	3.6	0.23	192	103	120
10/03/85	41	30	8.3	18.8	0.9	6.04	0.9	0.05	190	103	120

STATION: WEST FK SWIFT CR STATION NUMBER: STSF02
DRAINAGE AREA: 20.2 SQ.MI.
LOCATION: SEC 34 T34N R23W STILLWATER STATE FOREST
******DEFAULT VALUE OF -1 INDICATES NO DATA******

DATE	PO4 TOTAL MG\L	PO4 TOT LB/D	PO4 ORTHO MG/L	PO4 ORTHO LB/D	NO3 MG/L	NO3 LB/D	CL ****	SO4 ****	CA ****	MG ****	NA MG/L	K ****	HCO3 ****	TDS ****
04/18/85	-1.000	-1.00	0.0010	0.21	0.114	23.45	0.08	1.6	25.2	7.0	0.7	0.2	111.6	146.3
05/01/85	0.008	2.46	0.0020	0.62	0.126	38.78	0.06	1.2	24.6	6.4	0.7	0.2	105.8	139.0
05/09/85	0.005	1.97	0.0010	0.39	0.115	45.21	0.26	1.5	24.1	6.4	0.7	0.2	104.4	138.1
05/15/85	0.004	2.26	0.0010	0.57	0.113	63.95	0.15	1.0	23.6	6.4	0.7	0.2	104.4	137.0
05/22/85	0.021	32.44	0.0020	3.09	0.137	211.66	0.25	1.1	20.1	5.3	0.6	0.2	87.8	116.0
05/29/85	0.006	5.11	0.0020	1.70	0.064	54.47	0.28	1.1	21.1	5.3	0.6	0.2	91.6	120.5
06/05/85	0.005	3.66	0.0020	1.47	0.046	37.71	0.16	1.1	22.2	5.6	0.6	0.2	97.0	127.1
06/13/85	0.004	2.26	0.0010	0.57	0.054	30.56	0.09	1.2	23.1	5.9	0.6	0.2	100.6	131.9
06/27/85	0.003	0.77	0.0010	0.26	0.026	6.70	0.06	1.4	25.3	6.7	0.7	0.2	111.2	145.6
07/25/85	0.003	0.50	0.0010	0.17	0.032	5.36	0.13	1.5	27.6	6.8	0.8	0.2	119.2	156.4
08/20/85	0.002	0.26	0.0010	0.13	0.030	3.92	0.06	1.2	27.5	6.8	0.8	0.2	119.4	157.0
10/03/85	0.002	0.20	0.0010	0.10	0.~~030~~ .025	~~3.93~~ 3.60	0.08	1.6	28.2	6.3	0.8	0.2	118.3	156.4

TABLE A-III 17

STATION: CHICKEN CREEK STATION NUMBER: STSF03
DRAINAGE AREA: 2.5 SQ.MI.
LOCATION: SEC 14 T34N R23W STILLWATER STATE FOREST
****** DEFAULT VALUE OF -1 INDICATES NO DATA******

DATE	AIR TEMP (F)	WATER TEMP (F)	PH	DISCHG (CFS)	DISCHG CFS/MI2	STAGE (FT)	TSS MG/L	TSS TON/DAY	SPEC COND UMHOS/CM	HARD-NESS MG/L	ALKA-LINITY MG/L
04/18/85	47	38	7.2	8.0	3.1	1.35	1.8	0.04	42	68	51
05/01/85	41	39	7.3	6.5	2.6	1.35	2.3	0.04	39	51	34
05/09/85	65	38	7.3	6.5	2.6	1.35	1.1	0.02	35	51	51
05/15/85	62	40	7.2	7.0	2.8	1.36	1.0	0.02	37	51	34
05/22/85	63	41	7.3	23.2	9.1	1.65	5.4	0.34	30	34	34
05/29/85	53	40	7.3	14.3	5.7	1.46	4.4	0.17	35	68	51
06/04/85	64	41	7.4	16.6	6.5	1.42	1.2	0.05	37	68	51
06/13/85	65	41	7.5	10.1	4.0	1.41	2.1	0.06	-1	86	51
06/27/85	44	41	7.7	8.5	3.3	1.40	3.4	0.08	37	68	51
07/25/85	67	44	7.6	4.8	1.9	1.31	1.6	0.02	45	34	51
08/20/85	61	44	7.5	3.1	1.2	1.29	0.4	0.00	50	34	34
10/03/85	47	40	7.6	4.6	1.3	1.30	0.7	0.01	47	34	51

STATION: CHICKEN CREEK STATION NUMBER: STSF03
DRAINAGE AREA: 2.5 SQ.MI.
LOCATION: SEC 14 T34N R23W STILLWATER STATE FOREST
******DEFAULT VALUE OF -1 INDICATES NO DATA******

DATE	PO4 TOTAL MG/L	PO4 TOT LB/D	PO4 ORTHO MG/L	PO4 ORTHO LB/D	NO3 MG/L	NO3 LB/D	CL ****	SO4 ****	CA ****	MG ****	NA MG/L	K ****	HCO3 ****	TDS ****
04/18/85	-1.000	-1.00	0.0050	0.22	0.062	2.68	0.32	1.6	3.3	1.4	1.5	0.2	18.0	26.6
05/01/85	0.011	0.39	0.0070	0.25	0.044	1.54	0.11	1.9	3.2	1.4	1.5	0.2	18.8	27.3
05/09/85	0.012	0.42	0.0060	0.21	0.021	0.74	0.20	1.8	2.8	1.7	1.4	0.1	18.2	26.3
05/15/85	0.008	0.30	0.0060	0.23	0.014	0.53	0.11	1.2	2.9	1.6	1.4	0.2	19.0	26.5
05/22/85	0.012	1.50	0.0070	0.88	0.033	4.13	0.10	1.4	2.2	1.3	1.2	0.2	14.4	20.9
05/29/85	0.009	0.69	0.0060	0.46	0.023	1.78	0.71	1.2	3.3	1.5	1.2	0.2	17.6	25.8
06/04/85	0.009	0.81	0.0070	0.63	0.014	1.25	0.12	1.2	3.0	1.3	1.2	0.2	17.0	24.9
06/13/85	0.008	0.44	0.0060	0.33	0.018	0.90	0.20	1.2	3.2	1.4	1.3	0.2	18.2	25.7
06/27/85	0.008	0.37	0.0060	0.28	0.006	0.28	0.04	1.4	3.8	1.5	1.4	0.1	21.8	30.1
07/25/85	0.009	0.23	0.0070	0.18	0.010	0.26	0.07	1.8	4.3	1.6	1.6	0.1	23.8	33.4
08/20/85	0.009	0.15	0.0060	0.10	0.008	0.13	0.08	1.8	4.3	1.6	1.8	0.1	24.0	33.8
10/03/85	0.008	0.20	0.0060	0.15	0.002	0.05	0.15	2.3	4.8	1.6	1.8	0.2	24.7	35.1

TABLE A. III 18

STATION:SWIFT CR @ CONC.BRIDGE STATION NUMBER:STSF05
DRAINAGE AREA: 50.6 SQ.MI.
LOCATION: SEC 24 T33N R23W STILLWATER STATE FOREST
****** DEFAULT VALUE OF -1 INDICATES NO DATA******

DATE	AIR TEMP (F)	WATER TEMP (F)	PH	DISCHG (CFS)	DISCHG CFS/MI2	STAGE (FT)	TSS MG/L	TSS TON/DAY	SPEC COND UMHOS/CM	HARD-NESS MG/L	ALKA-LINITY MG/L
04/18/85	48	37	7.8	221.6	4.4	9.47	10.4	6.22	134	103	103
05/01/85	56	38	8.0	281.1	5.6	9.30	9.6	7.29	136	103	86
05/09/85	69	40	8.0	305.4	6.0	9.22	7.4	6.10	136	103	86
05/15/85	62	41	8.1	341.0	7.1	9.26	5.1	4.97	143	103	86
05/22/85	77	44	8.1	744.4	14.7	8.14	28.8	57.80	130	103	86
05/29/85	53	41	8.1	665.3	13.2	8.36	11.4	20.48	141	103	86
06/04/85	50	44	8.1	524.8	10.4	8.55	22.3	31.60	138	120	86
06/13/85	63	43	8.1	469.8	9.3	8.93	5.5	6.98	-1	120	103
06/27/85	82	49	8.2	167.4	3.3	9.60	2.7	1.22	153	103	120
07/25/85	65	44	8.3	95.2	1.9	10.16	8.8	2.26	165	103	120
08/20/85	48	45	8.2	64.4	1.3	10.27	1.6	0.28	171	103	120
10/03/85	47	42	8.2	74.4	1.5	10.37	0.9	0.18	172	103	120

STATION: SWIFT @ CONC. BRIDGE STATION NUMBER: STSF05
DRAINAGE AREA: 50.6 SQ.MI.
LOCATION: SEC 24 T33N R23W STILLWATER STATE FOREST
******DEFAULT VALUE OF -1 INDICATES NO DATA******

DATE	PO4 TOTAL MG\L	PO4 TOT LB/D	PO4 ORTHO MG/L	PO4 ORTHO LB/D	NO3 MG/L	NO3 LB/D	CL ****	SO4 ****	CA ****	MG ****	NA MG/L	F ****	HCO3 ****	TDS ****
04/18/85	-1.000	-1.00	0.0010	1.20	0.108	129.24	0.13	2.1	17.8	5.2	1.0	0.2	81.0	107.9
05/01/85	0.010	15.18	0.0020	3.04	0.108	163.94	0.09	1.6	17.9	5.3	0.9	0.3	80.6	106.8
05/09/85	0.009	14.84	0.0010	1.65	0.096	158.32	0.13	1.4	18.5	5.0	1.0	0.2	83.0	109.6
05/15/85	0.005	9.75	0.0010	1.95	0.103	200.79	0.12	1.2	18.6	5.9	0.9	0.2	88.2	115.5
05/22/85	0.016	64.32	0.0020	8.04	0.146	586.88	0.16	1.4	17.3	4.8	0.8	0.2	77.1	102.5
05/29/85	0.007	25.15	0.0020	7.18	0.072	258.67	0.08	1.5	18.2	5.3	0.7	0.2	82.8	109.1
06/04/85	0.010	28.34	0.0010	2.83	0.058	164.37	0.14	1.2	18.7	5.6	0.7	0.2	85.8	112.6
06/13/85	0.006	15.22	0.0020	5.07	0.053	134.46	0.05	1.2	18.9	5.6	0.8	0.2	87.2	114.2
06/27/85	0.003	2.71	0.0010	0.90	0.037	33.45	0.06	1.4	20.9	6.3	0.8	0.2	96.4	126.1
07/25/85	0.003	1.54	0.0010	0.51	0.045	23.13	0.07	1.7	23.1	6.4	1.0	0.2	104.2	136.9
08/20/85	0.004	1.39	0.0020	0.70	0.042	14.95	0.08	1.5	23.2	6.3	1.0	0.2	105.8	137.3
10/03/85	0.003	1.21	0.0010	0.40	0.040	15.07	0.12	1.8	24.1	6.4	0.9	0.3	106.4	140.2

TABLE A ... 19

STATION:SWIFT CREEK AT CRAINS STATION NUMBER:STSF06
DRAINAGE AREA: 78.0 SQ.MI.
LOCATION: SEC 05 T3IN R22W STILLWATER STATE FOREST
****** DEFAULT VALUE OF -1 INDICATES NO DATA******

DATE	AIR TEMP (F)	WATER TEMP (F)	PH	DISCHG (CFS)	DISCHG CFS/MI2	STAGE (FT)	TSS MG/L	TSS TON/DAY	SPEC COND UMHOS/CM	HARD-NESS MG/L	ALKA-LINITY MG/L
04/17/85	59	41	7.7	295.5	3.8	2.42	26.6	21.22	102	103	86
04/30/85	70	48	8.0	234.8	3.0	2.30	16.0	10.65	127	86	68
05/08/85	53	42	8.0	396.1	5.1	2.60	27.3	29.20	129	86	68
05/18/85	68	46	8.1	316.3	4.1	2.52	9.1	7.77	135	103	103
05/21/85	71	49	7.9	774.7	9.9	3.35	145.7	304.76	127	86	86
05/28/85	58	46	8.0	661.2	8.5	3.16	74.8	133.54	135	103	86
06/05/85	54	45	8.0	529.7	6.8	2.92	39.6	56.64	140	137	86
06/12/85	75	47	8.1	483.2	6.2	2.87	27.3	35.62	127	103	86
06/26/85	78	50	8.2	183.9	2.4	2.08	6.4	3.21	136	103	86
07/25/85	78	61	8.3	69.4	0.9	1.49	6.2	1.16	163	103	103
08/20/85	61	54	8.2	47.7	0.6	1.41	1.0	0.13	159	86	103
10/03/85	50	45	8.2	50.9	0.7	1.40	0.9	0.12	160	103	103

STATION: SWIFT AT CRAINS STATION NUMBER: STSF06
DRAINAGE AREA: 78.0 SQ.MI.
LOCATION: SEC 05 T3IN R22W STILLWATER STATE FOREST
******DEFAULT VALUE OF -1 INDICATES NO DATA******

DATE	PO4 TOTAL MG\L	PO4 TOT LB/D	PO4 ORTHO MG/L	PO4 ORTHO LB/D	NO3 MG/L	NO3 LB/D	CL ****	SO4 ****	CA ****	MG ****	NA MG/L	F ****	HCO3 ****	TDS ****
04/17/85	-1.000	-1.00	0.0010	1.60	0.665	103.72	0.21	2.0	13.4	4.3	1.1	0.3	63.2	82.8
04/30/85	0.012	15.21	0.0010	1.27	0.034	43.11	0.12	1.4	16.8	4.4	1.0	0.3	75.2	99.3
05/08/85	0.069	19.25	0.0010	2.14	0.061	130.48	0.30	1.5	16.4	5.2	1.0	0.2	75.0	99.9
05/18/85	0.007	11.96	0.0010	1.71	0.046	78.57	0.11	1.5	17.2	5.6	1.0	0.2	81.4	107.2
05/21/85	0.070	292.84	0.0010	4.18	0.108	451.81	0.12	1.8	16.6	4.6	0.9	0.2	74.0	98.6
05/28/85	0.027	96.40	0.0020	7.14	0.075	267.79	0.11	1.6	17.9	4.9	0.9	0.2	80.0	105.9
06/05/85	0.013	37.19	0.0030	8.58	0.040	114.42	0.39	1.2	18.1	5.0	0.9	0.2	81.2	107.2
06/12/85	0.010	26.09	0.0010	2.61	0.032	83.50	0.13	1.2	17.4	5.2	0.8	0.2	80.2	105.2
06/26/85	0.003	3.01	0.0010	1.00	0.014	14.05	0.04	1.6	19.5	6.1	0.9	0.2	91.3	119.6
07/25/85	0.004	1.50	0.0020	0.75	0.008	3.00	0.06	1.7	22.5	6.2	1.1	0.2	101.8	133.6
08/20/85	0.009	2.32	0.0020	0.52	0.016	4.15	0.09	1.5	21.5	6.1	1.1	0.2	97.9	129.1
10/03/85	0.003	0.82	0.0010	0.28	0.016	4.40	0.41	1.8	22.9	6.3	1.1	0.3	102.3	135.2

TABLE A. III 20

STATION: CHEPAT CREEK STATION NUMBER: STSF08
DRAINAGE AREA: 1.8 SQ.MI.
LOCATION: SEC 05 T34N R24W STILLWATER STATE FOREST
****** DEFAULT VALUE OF -1 INDICATES NO DATA******

DATE	AIR TEMP (F)	WATER TEMP (F)	PH	DISCHG (CFS)	DISCHG CFS/MI2	STAGE (FT)	TSS MG/L	TSS TON/DAY	SPEC COND UMHOS/CM	HARD-NESS MG/L	ALKA-LINITY MG/L
04/30/85	66	37	7.8	8.2	4.6	0.56	1.9	0.04	22	68	68
05/08/85	47	37	7.9	11.3	6.4	0.59	1.2	0.04	93	103	86
05/14/85	66	38	7.9	8.7	4.9	0.56	1.1	0.03	88	86	86
05/21/85	77	41	7.9	29.3	16.3	0.96	10.7	0.85	94	86	86
05/28/85	55	39	8.0	20.3	11.4	0.87	5.0	0.27	99	86	68
06/05/85	52	40	8.1	17.9	10.0	0.78	2.0	0.10	108	103	86
06/12/85	81	46	8.0	13.1	7.4	0.72	2.0	0.07	108	86	86
06/26/85	73	45	8.1	6.0	3.3	0.49	1.1	0.02	118	86	86
07/25/85	68	48	8.1	3.4	1.9	0.37	0.1	0.00	133	86	86
08/20/85	49	45	8.0	2.7	1.5	0.35	1.1	0.01	134	68	86
10/03/85	34	34	8.1	2.3	1.3	0.40	0.7	0.00	132	86	103

STATION: CHEPAT CREEK STATION NUMBER: STSF08
DRAINAGE AREA: 1.8 SQ.MI.
LOCATION: SEC 05 T34N R24W STILLWATER STATE FOREST
******DEFAULT VALUE OF -1 INDICATES NO DATA******

DATE	PO4 TOTAL MG\L	PO4 TOT LB/D	PO4 ORTHO MG/L	PO4 ORTHO LB/D	NO3 MG/L	NO3 LB/D	CL ****	SO4 ****	CA ****	MG ****	NA MG/L	K ****	HCO3 ****	TDS ****
04/30/85	0.010	0.44	0.0020	0.09	0.019	0.84	0.09	1.2	19.1	2.6	0.8	0.1	45.8	69.7
05/08/85	0.005	0.30	0.0020	0.12	0.013	0.79	0.31	1.3	13.1	4.2	0.8	0.2	61.8	81.7
05/14/85	0.004	0.19	0.0020	0.09	0.009	0.42	0.07	1.0	13.3	4.2	0.8	0.2	62.8	82.4
05/21/85	0.014	2.21	0.0020	0.32	0.023	3.64	0.07	0.9	11.8	4.0	0.7	0.2	57.2	75.8
05/28/85	0.006	0.66	0.0020	0.22	0.013	1.43	0.08	1.1	13.9	4.2	0.6	0.2	64.6	84.7
06/05/85	0.005	0.48	0.0020	0.19	0.008	0.77	0.11	1.1	14.0	4.2	0.6	0.2	64.4	84.6
06/12/85	0.005	0.35	0.0020	0.14	0.010	0.71	0.04	1.0	13.4	4.1	0.6	0.2	63.0	82.3
06/26/85	0.003	0.10	0.0020	0.07	0.005	0.16	0.08	1.2	15.9	4.5	0.8	0.1	73.6	95.2
07/25/85	0.004	0.67	0.0010	0.02	0.020	0.37	0.03	1.2	18.7	4.6	0.9	0.1	80.6	106.3
08/20/85	0.004	0.06	0.0020	0.03	0.006	0.09	0.04	1.2	17.8	4.6	0.9	0.1	81.3	106.1
10/03/85	0.002	0.03	0.0010	0.01	0.003	0.04	0.15	1.7	16.4	4.6	0.9	0.3	79.9	105.5

TABLE A. III. 21

STATION: FITZSIMMONS CREEK STATION NUMBER: STSF09
DRAINAGE AREA: 11.3 SQ.MI.
LOCATION: SEC 05 T34N R24W STILLWATER STATE FOREST
*****DEFAULT VALUE OF -1 INDICATES NO DATA******

DATE	AIR TEMP (F)	WATER TEMP (F)	PH	DISCHG (CFS)	DISCHG CFS/MI2	STAGE (FT)	TSS MG/L	TSS TON/DAY	SPEC COND UMHOS/CM	HARD-NESS MG/L	ALKA-LINITY MG/L
04/30/85	66	41	7.9	51.2	4.5	0.68	1.7	0.23	118	68	86
05/08/85	47	39	8.1	55.4	4.9	0.76	1.3	0.19	134	86	103
05/14/85	62	42	8.1	44.2	3.9	0.70	1.2	0.14	137	103	86
05/21/85	65	43	7.9	134.9	11.9	1.32	9.4	3.42	119	103	86
05/28/85	60	40	8.0	159.3	14.1	1.18	2.2	0.95	129	103	86
06/04/85	58	41	8.1	95.2	8.4	1.04	2.0	0.51	125	103	86
06/12/85	78	47	8.0	125.9	11.1	1.02	1.1	0.37	122	103	86
06/26/85	68	46	8.2	53.4	4.7	0.70	1.5	0.22	150	103	103
07/25/85	73	49	8.2	14.7	1.3	0.38	1.0	0.04	169	103	103
08/20/85	49	44	8.1	15.5	1.4	0.30	1.5	0.06	166	86	120
10/03/85	34	36	8.1	14.2	1.3	0.36	0.5	0.02	155	86	103

STATION: FITZSIMMONS CREEK STATION NUMBER: STSF09
DRAINAGE AREA: 11.3 SQ.MI.
LOCATION: SEC 05 T34N R24W STILLWATER STATE FOREST
******DEFAULT VALUE OF -1 INDICATES NO DATA******

DATE	PO4 TOTAL MG\L	PO4 TOT LB/D	PO4 ORTHO MG/L	PO4 ORTHO LB/D	NO3 MG/L	NO3 LB/D	CL ****	SO4 ****	CA ****	MG ****	NA MG/L	K ****	HCO3 ****	TDS ****
04/30/85	0.008	2.21	0.0010	0.28	0.026	7.19	0.28	1.4	15.1	4.9	0.9	0.2	71.6	94.4
05/08/85	0.004	1.20	0.0010	0.30	0.020	5.98	0.09	1.2	16.9	5.0	0.9	0.2	79.2	103.6
05/14/85	0.002	0.48	0.0010	0.24	0.018	4.30	0.07	1.3	17.6	5.8	0.8	0.2	84.1	110.0
05/21/85	0.057	41.52	0.0010	0.73	0.033	24.04	0.09	1.0	14.9	4.5	0.7	0.2	69.7	91.3
05/28/85	0.006	5.16	0.0010	0.86	0.014	12.04	0.09	1.0	15.9	4.6	0.6	0.2	72.6	95.0
06/04/85	0.004	2.06	0.0010	0.51	0.008	4.11	0.12	1.1	16.6	4.7	0.7	0.2	76.0	99.4
06/12/85	0.004	2.72	0.0010	0.58	0.009	6.12	0.05	1.0	16.9	5.2	0.7	0.2	79.4	103.5
06/26/85	0.002	0.58	0.0010	0.29	0.002	0.58	0.03	1.2	20.3	6.1	0.8	0.2	93.8	122.4
07/25/85	0.002	0.16	0.0010	0.08	0.002	0.16	0.04	1.5	23.0	6.3	0.9	0.2	104.2	136.7
08/20/85	0.003	0.25	0.0010	0.08	0.009	0.75	0.06	1.6	22.2	6.6	1.0	0.2	102.2	134.3
10/03/85	0.002	0.15	0.0010	0.08	0.004	0.31	0.11	1.6	21.2	5.9	1.0	0.2	95.4	126.4

TABLE A.III. 22

STATION:LAZY CR. STATION NUMBER:STSF10
DRAINAGE AREA: 17.6 SQ.MI.
LOCATION: SEC 05 T31N R22W STILLWATER STATE FOREST
****** DEFAULT VALUE OF -1 INDICATES NO DATA******

DATE	AIR TEMP (F)	WATER TEMP (F)	PH	DISCHG (CFS)	DISCHG CFS/MI2	STAGE (FT)	TSS MG/L	TSS TON/DAY	SPEC COND UMHOS/CM	HARD-NESS MG/L	ALKA-LINITY MG/L
04/17/85	57	47	7.7	52.7	3.0	1.45	21.0	2.99	183	103	103
04/30/85	69	54	8.0	23.1	1.3	1.75	5.0	0.31	202	120	120
05/08/85	52	47	8.1	24.1	1.4	2.53	3.4	0.22	215	137	137
05/14/85	67	53	8.1	7.7	0.5	2.46	1.7	0.04	215	120	137
05/21/85	66	64	8.1	-1.0	-1.0	3.02	-1.0	-1.00	210	137	157
05/28/85	55	51	8.1	-1.0	-1.0	3.75	1.3	-1.00	210	154	137
06/05/85	57	49	8.0	-1.0	-1.0	3.67	2.2	-1.00	205	171	137
06/12/85	77	54	8.0	-1.0	-1.0	3.67	2.4	-1.00	200	137	154
08/20/85	58	53	8.1	27.0	1.5	0.92	2.4	0.17	201	103	120
10/03/85	50	45	8.1	20.0	1.1	0.82	1.2	0.07	215	120	120

STATION: LAZY CR. STATION NUMBER: STSF10
DRAINAGE AREA: 17.6 SQ.MI.
LOCATION: SEC 05 T31N R22W STILLWATER STATE FOREST
******DEFAULT VALUE OF -1 INDICATES NO DATA******

DATE	PO4 TOTAL MG\L	PO4 TOT LB/D	PO4 ORTHO MG/L	PO4 ORTHO LB/D	NO3 MG/L	NO3 LB/D	CL ****	SO4 ****	CA ****	MG ****	NA MG/L	K ****	HCO3 ****	TDS ****
04/17/85	-1.000	-1.00	0.0050	1.42	0.021	5.98	0.45	2.3	24.2	7.2	2.2	0.9	111.8	146.8
04/30/85	0.020	2.50	0.0060	0.75	0.019	2.37	0.49	2.4	29.9	8.4	2.2	0.7	137.2	181.3
05/08/85	0.022	2.86	0.0060	0.78	0.017	2.21	0.23	2.3	30.6	9.1	2.3	0.5	142.8	187.8
05/14/85	0.011	0.47	0.0040	0.17	0.017	0.73	0.19	1.5	30.9	9.1	2.3	0.5	145.0	189.6
05/21/85	0.014	-1.00	0.0040	-1.00	0.025	-1.00	0.17	1.7	31.2	9.0	2.1	0.5	145.0	189.8
05/28/85	0.012	-1.00	0.0050	-1.00	0.015	-1.00	0.23	1.2	30.4	9.0	2.0	0.4	142.8	186.6
06/05/85	0.012	-1.00	0.0040	-1.00	0.011	-1.00	0.24	1.9	30.6	8.9	2.1	0.4	143.0	187.2
06/12/85	0.012	-1.00	0.0040	-1.00	0.010	-1.00	0.15	1.5	30.9	9.0	2.1	0.4	144.2	188.3
08/20/85	0.011	1.60	0.0040	0.58	0.014	2.04	0.08	1.7	29.6	8.7	1.9	0.5	138.2	181.7
10/03/85	0.013	1.40	0.0020	0.29	0.004	0.43	0.23	1.8	31.2	8.1	1.9	0.6	140.5	184.0

TABLE A III 23

STATION:EAST FK. SWIFT CR. STATION NUMBER:STSF01
DRAINAGE AREA: 7.6 SQ.MI.
LOCATION: SEC 17 T34N R17W STILLWATER STATE FOREST
****** DEFAULT VALUE OF -1 INDICATES NO DATA******

DATE	AIR TEMP (F)	WATER TEMP (F)	PH	DISCHG (CFS)	DISCHG CFS/MI2	STAGE (FT)	TSS MG/L	TSS TON/DAY	SPEC COND UMHOS/CM	HARD-NESS MG/L	ALKA-LINITY MG/L
04/09/86	38	35	8.1	25.5	3.4	0.94	2.0	0.14	140	-1	-1
04/22/86	41	37	8.1	41.4	5.4	0.96	2.5	0.28	154	-1	-1
05/12/86	45	37	7.8	112.2	7.4	1.40	0.9	0.27	160	-1	-1
05/20/86	59	39	8.1	75.8	10.0	1.21	7.9	1.62	152	-1	-1
05/30/86	78	42	8.0	292.0	38.4	1.70	19.1	15.06	-1	-1	-1
06/03/86	60	41	8.1	124.0	16.3	1.46	3.8	1.27	114	-1	-1
06/09/86	63	43	8.0	86.1	11.3	1.27	3.2	0.74	122	-1	-1
06/23/86	44	-1	8.1	28.0	3.7	0.96	1.1	0.08	144	-1	-1
07/19/86	57	45	8.1	16.8	2.2	0.68	1.0	0.04	-1	-1	-1
08/23/86	58	43	8.1	7.1	0.9	0.49	0.9	0.02	-1	-1	-1

STATION: EAST FK SWIFT STATION NUMBER: STSF01
DRAINAGE AREA: 7.6 SQ.MI.
LOCATION: SEC 17 T34N R17W STILLWATER STATE FOREST
******DEFAULT VALUE OF -1 INDICATES NO DATA******

DATE	PO4 TOTAL MG\L	PO4 TOT LB/D	PO4 ORTHO MG/L	PO4 ORTHO LB/D	NO3 MG/L	NO3 LB/D	CL ****	SO4 ****	CA ****	MG ****	NA MG/L	K ****	HCO3 ****	TDS ****
04/09/86	0.005	0.69	0.0015	0.207	0.167	23.00	0.03	1.3	17.9	5.7	0.9	0.1	83.8	110.7
04/22/86	0.004	0.89	0.0008	0.179	0.188	42.03	0.08	1.5	16.9	6.8	0.8	0.2	91.9	120.6
05/12/86	0.003	1.82	0.0010	0.606	0.085	52.11	0.05	1.5	9.0	3.1	0.9	0.2	43.5	56.4
05/20/86	0.010	4.09	0.0012	0.491	0.153	62.63	0.05	1.3	19.7	6.0	0.7	0.2	90.3	118.0
05/30/86	0.018	28.38	0.0012	1.892	0.080	126.14	0.02	0.8	14.1	4.1	0.5	0.2	64.4	85.0
06/03/86	0.007	4.69	0.0015	1.071	0.083	55.58	0.04	0.8	15.1	5.3	0.6	0.2	73.5	96.1
06/09/86	0.005	2.33	0.0013	0.604	0.096	44.63	0.05	1.0	17.2	5.9	0.7	0.2	82.8	107.3
06/23/86	0.003	0.45	0.0006	0.091	0.157	23.74	0.04	1.1	19.8	6.3	0.8	0.2	92.7	121.2
07/19/86	0.003	0.27	0.0007	0.064	0.178	17.96	0.04	1.2	20.1	7.3	0.8	0.2	98.5	129.1
08/23/86	0.002	0.08	0.0003	0.012	0.151	5.79	0.03	1.1	21.0	7.7	0.9	0.1	102.3	134.4

TABLE A III. 24

STATION:WEST FK. SWIFT CR. STATION NUMBER:STSF02
DRAINAGE AREA: 20.2 SQ.MI.
LOCATION: SEC 34 T34N R23W STILLWATER STATE FOREST
****** DEFAULT VALUE OF -1 INDICATES NO DATA******

DATE	AIR TEMP (F)	WATER TEMP (F)	PH	DISCHG (CFS)	DISCHG CFS/MI2	STAGE (FT)	TSS MG/L	TSS TON/DAY	SPEC COND UMHOS/CM	HARD-NESS MG/L	ALKA-LINITY MG/L
04/09/86	50	37	8.2	29.5	1.5	5.79	2.5	0.20	180	-1	-1
04/22/86	42	37	8.1	48.6	2.4	5.67	2.3	0.29	180	-1	-1
05/12/86	44	38	8.2	66.4	3.3	5.58	2.5	0.45	185	-1	-1
05/20/86	60	42	8.1	97.1	4.8	5.29	19.2	5.03	165	-1	-1
05/30/86	78	44	8.1	392.0	19.4	4.56	56.6	59.91	-1	-1	-1
06/03/86	64	43	8.2	165.0	8.2	5.25	9.5	4.23	137	-1	-1
06/09/86	64	44	8.2	82.1	4.1	5.38	4.1	0.91	154	-1	-1
06/24/86	-1	-1	8.2	50.0	2.5	5.54	1.7	0.23	172	-1	-1
07/20/86	43	41	8.2	31.0	1.5	5.88	1.0	0.08	-1	-1	-1
08/23/86	58	41	8.2	27.6	1.4	6.00	1.2	0.09	-1	-1	-1

STATION: WEST FK SWIFT CR STATION NUMBER: STSF02
DRAINAGE AREA: 20.2 SQ.MI.
LOCATION: SEC 34 T34N R23W STILLWATER STATE FOREST
******DEFAULT VALUE OF -1 INDICATES NO DATA******

DATE	PO4 TOTAL MG\L	PO4 TOT LB/D	PO4 ORTHO MG/L	PO4 ORTHO LB/D	NO3 MG/L	NO3 LB/D	CL ****	SO4 ****	CA ****	MG ****	NA MG/L	K ****	HCO3 ****	TDS ****
04/09/86	0.005	0.80	0.0015	0.24	0.087	13.86	0.07	1.2	27.4	6.0	0.8	0.2	114.5	149.4
04/22/86	0.005	1.31	0.0007	0.18	0.095	24.93	0.11	1.1	26.4	5.9	0.8	0.2	111.0	145.9
05/12/86	0.004	1.43	0.0007	0.25	0.086	30.84	0.11	1.0	26.2	5.8	0.7	0.2	109.7	143.2
05/20/86	0.015	7.87	0.0017	0.87	0.069	36.18	0.06	1.0	25.1	5.1	0.6	0.2	102.7	133.4
05/30/86	0.034	71.97	0.0019	4.02	0.043	91.02	0.03	0.6	18.8	4.0	0.5	0.2	76.4	103.0
06/03/86	0.008	7.13	0.0030	2.67	0.044	39.20	0.06	0.5	21.6	4.9	0.6	0.2	91.8	119.8
06/09/86	0.006	2.66	0.0025	1.11	0.041	18.18	0.02	0.8	23.7	5.4	0.6	0.2	100.4	131.8
06/24/86	0.004	1.08	0.0008	0.22	0.043	11.51	0.03	0.6	26.7	5.8	0.7	0.2	111.9	146.2
07/20/86	0.003	0.50	0.0009	0.15	0.077	12.89	0.02	0.6	27.1	6.0	0.7	0.2	117.0	153.0
08/23/86	0.002	0.30	0.0005	0.07	0.040	5.96	0.06	0.8	29.1	6.8	0.7	0.1	122.6	160.5

TABLE A III. 25

STATION: CHICKEN CREEK STATION NUMBER: STSF03
DRAINAGE AREA: 2.5 SQ.MI.
LOCATION: SEC 14 T34N R23W STILLWATER STATE FOREST
****** DEFAULT VALUE OF -1 INDICATES NO DATA******

DATE	AIR TEMP (F)	WATER TEMP (F)	PH	DISCHG (CFS)	DISCHG CFS/MI2	STAGE (FT)	TSS MG/L	TSS TON/DAY	SPEC COND UMHOS/CM	HARD-NESS MG/L	ALKA-LINITY MG/L
04/09/86	53	38	7.3	9.5	3.8	1.44	4.0	0.10	37	-1	-1
04/22/86	43	39	7.4	9.4	3.8	1.40	6.5	0.01	38	-1	-1
05/05/86	48	39	7.4	9.4	3.8	1.40	1.2	0.04	35	-1	-1
05/12/86	43	39	7.5	10.0	2.0	1.42	0.8	0.02	38	-1	-1
05/20/86	66	41	7.4	12.4	5.0	1.44	1.4	0.05	35	-1	-1
05/30/86	76	44	7.4	22.9	9.2	1.54	3.0	0.18	30	-1	-1
06/03/86	62	42	7.4	7.0	2.8	1.36	1.7	0.03	35	-1	-1
06/09/86	65	42	7.4	10.8	4.3	1.42	1.4	0.04	36	-1	-1
06/24/86	-1	-1	7.5	7.0	2.8	1.36	0.1	0.00	42	-1	-1
07/20/86	59	43	7.6	3.0	1.2	1.30	1.0	0.01	-1	-1	-1
08/23/86	61	45	7.6	3.3	1.3	1.26	1.1	0.01	-1	-1	-1

STATION: CHICKEN CREEK STATION NUMBER: STSF03
DRAINAGE AREA: 2.5 SQ.MI.
LOCATION: SEC 14 T34N R23W STILLWATER STATE FOREST
******DEFAULT VALUE OF -1 INDICATES NO DATA******

DATE	PO4 TOTAL MG\L	PO4 TOT LB/D	PO4 ORTHO MG/L	PO4 ORTHO LB/D	NO3 MG/L	NO3 LB/D	CL ****	SO4 ****	CA ****	MG ****	NA MG/L	K ****	HCO3 ****	TDS ****
04/09/86	0.011	0.56	0.0070	0.36	0.019	0.97	0.06	0.9	3.4	1.1	1.5	0.2	19.0	25.4
04/22/86	0.008	0.41	0.0060	0.30	0.013	0.66	0.08	1.4	3.5	1.3	1.5	0.2	19.7	27.6
05/05/86	0.010	0.51	0.0060	0.30	0.010	0.51	0.06	1.1	3.9	1.2	1.3	0.1	20.2	25.7
05/12/86	0.008	0.43	0.0060	0.32	0.011	0.59	0.06	1.0	3.4	1.2	1.3	0.2	18.9	23.8
05/20/86	0.014	0.94	0.0070	0.47	0.003	0.20	0.05	1.3	3.7	1.1	1.4	0.2	19.2	26.2
05/30/86	0.018	2.23	0.0074	0.92	0.008	0.99	0.02	0.8	2.6	1.1	1.2	0.2	16.6	21.7
06/03/86	0.011	0.42	0.0067	0.25	0.009	0.34	0.03	0.9	2.7	1.4	1.3	0.2	18.0	24.6
06/09/86	0.010	0.58	0.0072	0.42	0.005	0.29	0.03	1.0	3.7	1.3	1.3	0.1	20.3	27.6
06/24/86	0.010	0.38	0.0067	0.25	0.009	0.34	0.03	1.0	4.2	1.5	1.5	0.2	23.5	31.3
07/20/86	0.013	0.21	0.0072	0.13	0.009	0.13	0.03	1.3	4.4	1.6	1.5	0.2	24.2	33.6
08/23/86	0.007	0.12	0.0100	0.16	0.007	0.12	0.03	1.3	4.7	1.6	1.7	0.1	25.7	35.2

TABLE A III.26

STATION:SWIFT CR @ CONC.BRIDGE STATION NUMBER:STSF05
DRAINAGE AREA: 50.6 SQ.MI.
LOCATION: SEC 24 T33N R23W STILLWATER STATE FOREST
****** DEFAULT VALUE OF -1 INDICATES NO DATA******

DATE	AIR TEMP (F)	WATER TEMP (F)	PH	DISCHG (CFS)	DISCHG CFS/MI2	STAGE (FT)	TSS MG/L	TSS TON/DAY	SPEC COND UMHOS/CM	HARD- NESS MG/L	ALKA- LINITY MG/L
04/09/86	70	39	8.0	-1.0	-1.0	9.64	5.0	-1.00	135	-1	-1
04/21/86	46	39	8.1	-1.0	-1.0	9.55	3.4	-1.00	148	-1	-1
05/05/86	48	40	8.0	345.9	6.8	9.25	14.7	13.73	150	-1	-1
05/12/86	43	40	8.1	315.8	6.2	9.40	3.2	2.73	151	-1	-1
05/21/86	60	42	8.1	-1.0	-1.0	9.17	18.3	-1.00	149	-1	-1
05/30/86	68	47	8.1	-1.0	-1.0	8.46	29.3	-1.00	-1	-1	-1
06/03/86	64	46	8.1	535.0	10.6	8.75	9.0	13.00	128	-1	-1
06/09/86	63	46	8.1	377.9	7.5	9.17	4.9	5.00	137	-1	-1
06/24/86	-1	-1	8.1	-1.0	-1.0	9.71	2.0	-1.00	152	-1	-1
07/20/86	61	43	8.1	102.0	2.0	10.13	1.6	0.44	-1	-1	-1
08/23/86	61	45	8.2	66.8	1.3	10.45	1.3	0.23	-1	-1	-1

STATION: SWIFT @ CONC. BRIDGE STATION NUMBER: STSF05
DRAINAGE AREA: 50.6 SQ.MI.
LOCATION: SEC 24 T33N R23W STILLWATER STATE FOREST
******DEFAULT VALUE OF -1 INDICATES NO DATA******

DATE	PO4 TOTAL MG\L	PO4 TOT LB/D	PO4 ORTHO MG/L	PO4 ORTHO LB/D	NO3 MG/L	NO3 LB/D	CL ****	SO4 ****	CA ****	MG ****	NA MG/L	K ****	HCO3 ****	TDS ****
04/09/86	0.010	-1.00	0.0013	-1.00	0.078	-1.00	0.08	1.2	18.9	4.7	1.0	0.2	83.5	109.1
04/21/86	0.004	-1.00	0.0005	-1.00	6.077	-1.00	0.11	1.4	21.2	4.8	0.9	0.2	89.5	118.0
05/05/86	0.019	35.49	0.0010	1.87	0.070	130.75	0.09	1.1	19.5	4.8	0.9	0.2	84.7	111.1
05/12/86	0.005	8.53	0.0007	1.19	0.091	155.18	0.08	1.1	21.1	5.3	0.8	0.2	92.1	119.6
05/21/86	0.019	-1.00	0.0015	-1.00	0.080	-1.00	0.06	1.1	21.1	5.0	0.8	0.2	90.4	116.8
05/30/86	0.025	-1.00	0.0010	-1.00	0.058	-1.00	0.03	0.9	17.8	4.6	0.8	0.2	78.7	101.9
06/03/86	0.012	34.67	0.0031	8.96	0.054	156.01	0.06	0.5	18.6	5.1	0.7	0.2	83.9	109.5
06/09/86	0.005	10.20	0.0010	2.04	0.053	108.15	0.04	0.9	20.2	5.4	0.8	0.2	90.1	117.5
06/24/86	0.004	-1.00	0.0005	-1.00	0.051	-1.00	0.04	0.8	22.8	5.6	0.8	0.2	99.2	128.9
07/20/86	0.007	3.86	0.0007	0.39	0.089	49.02	0.13	0.8	23.8	5.9	0.9	0.2	103.7	136.2
08/23/86	0.003	1.08	0.0003	0.11	0.051	18.40	0.05	1.0	24.5	6.5	0.9	0.2	108.4	141.6

TABLE A.III.27

STATION: SWIFT CREEK AT CRAINS STATION NUMBER: STSF06
DRAINAGE AREA: 78.0 SQ.MI.
LOCATION: SEC 05 T3IN R22W STILLWATER STATE FOREST
****** DEFAULT VALUE OF -1 INDICATES NO DATA******

DATE	AIR TEMP (F)	WATER TEMP (F)	PH	DISCHG (CFS)	DISCHG CFS/MI2	STAGE (FT)	TSS MG/L	TSS TON/DAY	SPEC COND UMHOS/CM	HARD-NESS MG/L	ALKA-LINITY MG/L
04/09/86	64	45	8.0	191.4	2.5	2.16	33.1	17.11	127	-1	-1
04/21/86	68	44	8.0	105.7	1.4	1.80	10.7	3.05	144	-1	-1
05/05/86	59	46	8.0	366.9	4.7	2.56	104.1	103.12	130	-1	-1
05/12/86	53	42	8.1	294.4	3.8	2.32	10.2	8.16	147	-1	-1
05/20/86	59	48	8.1	269.8	3.5	2.40	44.4	32.34	142	-1	-1
05/30/86	79	51	8.0	642.0	8.2	3.20	121.1	209.91	130	-1	-1
06/03/86	66	48	8.1	477.7	6.1	2.86	34.6	44.63	124	-1	-1
06/09/86	70	53	8.1	292.4	3.7	2.48	21.3	16.82	132	-1	-1
06/24/86	-1	-1	8.1	152.6	2.0	1.86	4.9	2.01	148	-1	-1
07/19/86	79	61	8.1	79.0	1.0	1.50	2.7	0.58	-1	-1	-1
08/22/86	75	59	8.3	32.0	0.4	1.26	2.4	0.21	-1	-1	-1

STATION: SWIFT AT CRAINS STATION NUMBER: ST3F06
DRAINAGE AREA: 78.0 SQ.MI.
LOCATION: SEC 05 T3IN R22W STILLWATER STATE FOREST
******DEFAULT VALUE OF -1 INDICATES NO DATA******

DATE	PO4 TOTAL MG\L	PO4 TOT LB/D	PO4 ORTHO MG/L	PO4 ORTHO LB/D	NO3 MG/L	NO3 LB/D	CL ****	SO4 ****	CA ****	MG ****	NA MG/L	K ****	HCO3 ****	TDS ****
04/09/86	0.013	13.44	0.0013	1.34	0.021	21.70	0.11	1.3	17.1	4.3	1.1	0.3	75.5	99.4
04/21/86	0.007	4.00	0.0003	0.17	0.030	17.12	0.13	1.2	19.4	4.7	1.1	0.2	84.5	111.1
05/05/86	0.076	71.33	0.0020	3.96	0.067	132.74	0.18	1.2	16.6	4.5	1.1	0.3	74.8	98.9
05/12/86	0.008	12.80	0.0007	1.12	0.050	80.03	0.09	1.1	19.4	5.0	1.0	0.2	85.8	112.4
05/20/86	0.020	29.14	0.0017	2.48	0.062	90.33	0.08	1.1	19.4	4.8	0.9	0.2	84.5	110.5
05/30/86	0.053	183.74	0.0016	5.55	0.045	156.01	0.03	0.9	17.3	4.5	0.8	0.3	76.9	100.5
06/03/86	0.013	33.53	0.0015	3.87	0.041	105.76	0.05	0.6	17.6	4.9	0.8	0.2	80.0	103.9
06/09/86	0.010	15.79	0.0026	4.11	0.026	41.05	0.06	0.8	20.0	5.1	0.9	0.2	88.5	114.3
06/24/86	0.005	4.10	0.0005	0.41	0.021	17.24	0.07	0.6	21.8	5.4	1.0	0.2	95.7	124.7
07/19/86	0.005	2.13	0.0008	0.34	0.047	20.05	0.05	0.8	22.4	5.7	1.0	0.2	99.0	129.8
08/22/86	0.003	0.54	0.0005	0.09	0.003	0.53	0.05	1.0	23.6	6.2	1.1	0.2	105.0	137.2

TABLE A.III.28

STATION: CHEPAT CREEK STATION NUMBER: STSF08
DRAINAGE AREA: 1.8 SQ.MI.
LOCATION: SEC 05 T34N R24W STILLWATER STATE FOREST
****** DEFAULT VALUE OF -1 INDICATES NO DATA******

DATE	AIR TEMP (F)	WATER TEMP (F)	PH	DISCHG (CFS)	DISCHG CFS/MI2	STAGE (FT)	TSS MG/L	TSS TON/DAY	SPEC COND UMHOS/CM	HARD-NESS MG/L	ALKA-LINITY MG/L
04/08/86	72	37	7.8	6.3	3.5	0.50	6.6	0.11	88	-1	-1
04/21/86	64	37	7.9	4.9	2.7	0.45	6.4	0.01	108	-1	-1
05/06/86	37	37	7.9	13.1	7.3	0.66	1.8	0.06	91	-1	-1
05/13/86	44	37	8.0	9.0	5.0	0.60	1.0	0.02	95	-1	-1
05/20/86	65	40	7.9	14.1	7.8	0.79	4.9	0.19	96	-1	-1
05/30/86	61	43	7.9	29.3	16.3	0.96	9.1	0.72	-1	-1	-1
06/03/86	57	44	8.0	11.7	6.5	0.65	3.0	0.10	110	-1	-1
06/09/86	58	43	8.1	6.9	3.8	0.52	1.5	0.03	114	-1	-1
06/23/86	58	48	8.1	3.7	2.1	0.37	1.4	0.01	122	-1	-1
07/19/86	59	48	8.1	2.4	1.3	0.29	1.3	0.01	-1	-1	-1
08/23/86	50	48	8.1	1.1	0.6	0.24	3.2	0.01	-1	-1	-1

STATION: CHEPAT CREEK STATION NUMBER: STSF08
DRAINAGE AREA: 1.8 SQ.MI.
LOCATION: SEC 05 T34N R24W STILLWATER STATE FOREST
******DEFAULT VALUE OF -1 INDICATES NO DATA******

DATE	P04 TOTAL NG\L	P04 TOT LB/D	P04 ORTHO MG/L	P04 ORTHO LB/D	NO3 MG/L	NO3 LB/D	CL ****	SO4 ****	CA ****	MG ****	NA MG/L	K ****	HCO3 ****	TDS ****
04/08/86	0.006	0.20	0.0010	0.03	0.003	0.10	0.07	0.8	11.6	2.7	0.9	0.2	56.6	67.1
04/21/86	0.002	0.05	0.0008	0.02	0.003	0.08	0.06	0.8	14.6	3.5	0.9	0.2	63.9	84.1
05/06/86	0.005	0.35	0.0020	0.14	0.005	0.35	0.03	0.8	11.9	2.8	0.8	0.2	52.3	68.4
05/13/86	0.002	0.12	0.0015	0.07	0.005	0.24	0.10	0.7	15.2	3.5	0.7	0.2	65.0	84.7
05/20/86	0.010	0.76	0.0025	0.19	0.001	0.08	0.06	0.7	13.7	3.1	0.7	0.2	56.7	75.7
05/30/86	0.014	2.21	0.0018	0.28	0.006	0.95	0.01	0.5	14.0	3.8	0.6	0.2	63.3	82.3
06/03/86	0.009	0.57	0.0036	0.23	0.008	0.51	0.05	0.6	15.9	4.3	0.6	0.2	72.5	93.6
06/09/86	0.004	0.16	0.0038	0.14	0.011	0.41	0.02	0.6	16.8	4.2	0.7	0.2	74.0	96.4
06/23/86	0.005	0.10	0.0016	0.03	0.007	0.14	0.04	0.5	18.1	4.1	0.8	0.2	77.4	101.2
07/19/86	0.008	0.10	0.0017	0.02	0.006	0.08	0.03	0.6	18.3	4.7	0.8	0.2	81.4	106.4
08/23/86	0.003	0.02	0.0012	0.01	0.007	0.04	0.03	0.6	20.1	4.8	0.9	0.2	88.0	114.6

TABLE A.III.29

STATION: FITZSIMMONS CREEK STATION NUMBER: STSF09
DRAINAGE AREA: 11.3 SQ.MI.
LOCATION: SEC 05 T34N R24W STILLWATER STATE FOREST
****** DEFAULT VALUE OF -1 INDICATES NO DATA******

DATE	AIR TEMP (F)	WATER TEMP (F)	PH	DISCHG (CFS)	DISCHG CFS/MI2	STAGE (FT)	TSS MG/L	TSS TON/DAY	SPEC COND UMHOS/CM	HARD-NESS MG/L	ALKA-LINITY MG/L
04/08/86	72	41	-1.0	39.6	3.5	0.57	2.5	0.27	136	-1	-1
04/21/86	63	40	8.1	26.9	2.4	0.50	0.9	0.07	154	-1	-1
05/06/86	39	38	8.1	63.8	5.6	0.79	4.1	0.71	136	-1	-1
05/13/86	45	37	8.1	53.9	4.6	0.75	2.5	0.36	140	-1	-1
05/20/86	65	41	8.1	69.7	6.2	0.84	4.8	0.90	139	-1	-1
05/30/86	60	43	8.0	169.0	15.0	1.54	16.0	7.30	-1	-1	-1
06/03/86	56	44	8.1	135.0	11.4	1.12	5.7	2.08	120	-1	-1
06/09/86	60	43	8.1	77.1	6.8	0.90	2.7	0.56	128	-1	-1
06/23/86	58	47	8.2	32.0	2.7	0.64	1.4	0.12	-1	-1	-1
07/19/86	61	50	8.2	23.0	1.9	0.42	1.1	0.07	-1	-1	-1
08/23/86	50	45	8.2	11.2	1.0	0.24	0.9	0.03	-1	-1	-1

STATION: FITZSIMMONS CREEK STATION NUMBER: ST8F09
DRAINAGE AREA: 11.3 SQ.MI.
LOCATION: SEC 05 T34N R24W STILLWATER STATE FOREST
******DEFAULT VALUE OF -1 INDICATES NO DATA******

DATE	PO4 TOTAL MG\L	PO4 TOT LB/D	PO4 ORTHO MG/L	PO4 ORTHO LB/D	NO3 MG/L	NO3 LB/D	CL ****	SO4 ****	CA ****	MG ****	NA MG/L	K ****	HCO3 ****	TDS ****
04/08/86	-1.000	-1.00	*****	-1.00	0.010	2.14	0.03	0.8	18.0	5.1	-0.1	-0.1	-1.0	-1.0
04/21/86	0.002	0.29	0.0005	0.07	0.027	3.92	0.08	1.3	21.0	5.7	0.9	0.2	93.9	123.5
05/06/86	0.003	1.03	0.0010	0.34	0.013	4.40	0.04	0.8	18.6	4.9	0.8	0.2	83.0	108.0
05/13/86	0.001	0.29	0.0005	0.15	0.018	5.24	0.05	0.9	19.8	5.3	0.8	0.2	88.5	114.5
05/20/86	0.010	3.76	0.0015	0.56	0.007	2.63	0.05	0.9	18.4	4.9	0.8	0.2	82.2	107.4
05/30/86	0.015	13.69	0.0011	1.00	0.008	7.30	0.02	0.5	14.7	3.8	0.6	0.2	65.4	84.9
06/03/86	0.005	3.65	0.0012	0.80	0.009	6.56	0.04	0.6	17.0	4.5	0.6	0.2	75.8	98.1
06/09/86	0.005	2.08	0.0026	1.08	0.009	3.75	0.06	0.8	19.2	5.0	0.7	0.1	85.0	109.9
06/23/86	0.004	0.69	0.0008	0.14	0.006	1.04	0.02	0.9	22.4	5.6	0.9	0.2	98.5	127.9
07/19/86	0.006	0.74	0.0007	0.09	0.005	0.62	0.06	0.8	22.5	6.1	0.9	0.2	100.7	132.7
08/23/86	0.002	0.12	0.0008	0.05	0.011	0.67	0.02	0.9	24.5	6.8	1.0	0.1	110.4	143.0

TABLE A.III. 30

STATION:LAZY CR. STATION NUMBER:STSF10
DRAINAGE AREA: 17.6 SQ.MI.
LOCATION: SEC 05 T3IN R22W STILLWATER STATE FOREST
****** DEFAULT VALUE OF -1 INDICATES NO DATA******

DATE	AIR TEMP (F)	WATER TEMP (F)	PH	DISCHG (CFS)	DISCHG CFS/MI2	STAGE (FT)	TSS MG/L	TSS TON/DAY	SPEC COND UMHOS/CM	HARD-NESS MG/L	ALKA-LINITY MG/L
04/08/86	60	45	8.0	-1.0	-1.0	1.69	6.6	-1.00	200	-1	-1
04/21/86	67	48	8.1	25.0	1.4	1.86	3.0	0.20	200	-1	-1
05/05/86	62	52	8.1	-1.0	-1.0	2.12	3.7	-1.00	200	-1	-1
05/12/86	55	45	8.2	32.9	1.9	2.21	1.3	0.12	220	-1	-1
05/21/86	59	49	8.0	-1.0	-1.0	2.07	2.8	-1.00	205	-1	-1
05/30/86	79	63	8.2	27.0	1.5	2.84	1.5	0.11	200	-1	-1
06/03/86	66	55	8.1	0.0	0.0	3.29	1.9	-1.00	230	-1	-1
06/09/86	70	60	8.2	0.0	0.0	2.99	2.1	-1.00	214	-1	-1
06/24/86	-1	-1	8.1	0.0	0.0	1.90	1.4	-1.00	225	-1	-1
07/19/86	77	61	8.2	12.0	0.7	1.29	1.9	0.06	-1	-1	-1

STATION: LAZY CR. STATION NUMBER: STSF10
DRAINAGE AREA: 17.6 SQ.MI.
LOCATION: SEC 05 T3IN R22W STILLWATER STATE FOREST
******DEFAULT VALUE OF -1 INDICATES NO DATA******

DATE	PO4 TOTAL MG\L	PO4 TOT LB/D	PO4 ORTHO MG/L	PO4 ORTHO LB/D	NO3 MG/L	NO3 LB/D	CL ****	SO4 ****	CA ****	MG ****	NA MG/L	K ****	HCO3 ****	TDS ****
04/08/86	0.014	-1.00	0.0070	-1.00	0.011	-1.00	0.32	1.6	30.0	6.9	2.3	0.7	131.2	172.5
04/21/86	0.011	1.49	0.0040	0.54	0.011	1.49	0.35	1.9	32.6	7.5	2.3	0.5	141.4	186.3
05/05/86	0.007	-1.00	0.0060	-1.00	0.013	-1.00	0.33	1.3	31.1	7.6	2.4	0.6	138.6	179.6
05/12/86	0.010	1.78	0.0040	0.71	0.007	1.24	0.38	1.6	33.3	7.9	2.3	0.5	146.1	190.3
05/21/86	0.017	-1.00	0.0050	-1.00	0.004	-1.00	0.18	1.4	33.1	7.6	2.2	0.5	144.1	187.6
05/30/86	0.017	2.48	0.0054	0.79	0.007	1.02	0.12	0.9	33.3	7.6	2.4	0.5	146.0	187.8
06/03/86	0.018	-1.00	0.0061	0.00	0.007	-1.00	0.12	0.9	31.2	9.0	2.0	0.4	145.5	180.5
06/09/86	0.015	-1.00	0.0043	0.00	0.002	-1.00	0.21	1.4	31.7	8.4	2.1	0.4	143.3	186.4
06/24/86	0.013	-1.00	0.0034	0.00	0.010	-1.00	0.15	0.8	32.0	8.6	2.0	0.3	142.8	185.6
07/19/86	0.011	0.71	0.0026	0.17	0.007	0.45	0.10	1.1	31.5	8.2	1.9	0.3	141.7	184.7

SECTION B

LIMNOLOGY

Limnological Data collected by Flathead Lake Biological Station, University of Montana, Polson, MT 59860.

Table B.1. Secchi disc depth (m), depth (m) of 1% surface insolation and the total extinction coefficient (n/m) for the upper 30 m are given for the midlake deep site, Flathead Lake, Montana, 1981-1986.

date	time	secchi Z	1% Io Z	n/m
810723	1030	8.1	17.5	.2353
810814	1000	11.7	19.7	.2116
810911		12.2	21.7	.1919
811119	1110	10.1	13.0	.1619
811119	1505	10.1	12.5	.1902
820218	1540	10.5	25.5	.1700
820325	1135	10.5	22.1	.1856
820423			22.6	.1870
820601	1000	3.0	14.3	.2305
820707			10.5	.2688
820817		12.0	17.7	.2241
821001	947		22.9	.1762
821115	1020	11.5	20.8	.1821
830414	1000		20.4	.1972
840228	1000	11.0	24.0	.1686
840414		11.5	21.4	.1914
840520	1025		23.1	.1860
840801		10.5	22.6	.1854
841116		14.0	9.6	.1852
850107	1430	13.5	16.9	.2320
850212		9.5	6.4	.2309
850308		12.0	11.4	.1894
850501		11.3	21.7	.1864
850522		11.3	21.8	.1784
850619		6.0	14.5	.2650
850719		10.8	14.0	.2245
850819		9.8	22.0	.1909
850920		10.5	20.3	.2028
851205	1007	11.5	22.9	.1729
860107	1150		1.0	.1814
860205	1011		11.0	.1812
860305	1145		21.8	.1764
860403	926	12.5	19.8	.2242
860417	1050		22.3	.1792
860502	1039	11.4	22.0	.1908
860515	1147	14.0	22.8	.1651
860606	1144	1.6	18.3	.2034
860702	1015	8.8	14.7	.2558
860730	1024	11.0	21.3	.1979
860805	1508	12.6	21.8	.1972
860904	1130	16.0	22.2	.1948
861008	1115		21.1	.1999

Table B.2. Mean chlorophyll a concentration in ug/l (± 1.0 standard deviation) for integrated samples (n=3) and samples collected at the depth of maximum and minimum relative fluorescence (n=2) from the midlake deep site, Flathead Lake, Montana, 1985-86.

DATE	CONCENTRATION 0-30.0m integrated sample	@depth of maximum fluorescence	@depth of minimum fluorescence
850330	1.29	1.73	.512
850501	1.71	2.05	1.36
850522	.914	1.15	.492
850619	1.16	1.37	1.04
850719	1.09	1.90	.396
850819	1.02	1.35	.793
850923	1.00	1.41	.564
851205	.934 (.029)	.753	.555
860107	.806 (.262)	1.59	.159
860205	.951 (.000)	1.20 (.05)	.211 (.000)
860305	.644 (.095)	.793 (.000)	.247 (.025)
860403	.588 (.040)	.819 (.037)	.499 (.095)
860417	.743 (.070)	.555 (.112)	.476 (.224)
860502	.872 (.112)	.872 (.112)	.713 (.112)
860515	.529 (.075)	.590	.419 (.013)
860606	1.40 (.16)	1.52 (.10)	1.40 (.02)
860702	1.79 (.09)	2.57 (.03)	1.18 (.09)
860730	1.02 (.08)	1.70 (.04)	.605 (.025)
860805		1.50 (.03)	
860902		1.43 (.11)	.793 (.000)
860904	1.23 (.17)		

Table B.3. Mean chlorophyll a concentrations (± 1.0 standard deviation) of duplicate samples collected at the depth of maximum relative fluorescence and duplicate integrated samples collected from major bays and the midlake deep site, Flathead Lake, Montana, 4, 5 August 1986. Integrated profiles in deep bays and midlake extended from the surface to the depth of 1% incident light and in shallow bays to the bottom.

date	site	integrated profile		maximum fluorescence	
		depth	concentration	depth	concentration
860804	Polson Bay	0-5.0	.635 (.059)		
860804	East Bay	0-3.5	.742 (.104)		
860804	Skidoo Bay	0-21.0	1.02 (.06)	16.0	2.33 (.28)
860804	Somers Bay	0-6.5	.674 (.088)	6.0	.844 (.072)
860804	Big Arm Bay	0-21.0	.737 (.163)	20.0	1.32 (.04)
860804	Dayton Bay	0-10.0	.592		
860805	Midlake Deep	0-21.0	.943 (.137)	16.0	1.50 (.04)
860805	Midlake North	0-21.0	1.00 (.29)	17.0	2.28 (.22)
860805	Woods Bay	0-21.0	1.07 (.12)	18.0	1.83 (.17)
860805	Yellow Bay	0-21.0	1.01 (.08)	20.0	1.94 (.08)

Table B.4. Temporal distribution in the biomass (um^3/ml) of phytoplankton systematic groups in samples collected at discrete depths and integrated (0-30m) samples from the midlake deep site, Flathead Lake, Montana, 1983-1986.

date	depth	Chloro	Eugleno	Dino	Crypto	Xantho	Chryso	Bacillario Centrales	Bacillario Pennales	Cyano
830126	5.0	3460		5977	18952		1218	3111	10780	691
830302	5.0	2073		5964	7288		715		7887	417
830413	5.0	6965		13770	2757	70	1575	2433	77902	89
830504	5.0	11183		20071	6738		31158	6517	88157	337
830531	5.0	8626		20741	17496		41875	32183	72680	1068
830725	.1	15255			3074		31850	69859	101619	99512
830725	10.0	25239		87843	16206		34058	64790	137115	45654
830725	20.0	19309		2607	7309		47592	300970	237527	11454
830831	5.0	2491		30217	2659		8081	521	1702	2603
840131	5.0	10704	386	11915	9599		38830	84532	312297	4486
840305	5.0	13821		48102	8187		14565	31073	16220	1332
840403	5.0	9838		38668	12256		18110	85094	16057	28
840501	5.0	32878		12639	6713		67274	133661	70827	1085
840515	5.0	9674		36590	5882		77946	12015	32297	265
840524	5.0	22377		51203	6060		82711	13184	37139	360
840625	5.0	32830		70386	12410		10874	37725	155809	3255
840724	5.0	23274		88017	13893		14090	14839	81059	2473
840807	5.0	10180	2834	31372	19757		32008	5542	19616	18455
840905	5.0	5071	315	38649	5919		20677	2865	15479	26100
841002	5.0	9626		128112	47689		17533	3654	33115	10738
841112	5.0	4258		65211	15846		2862	15622	40811	3411
841212	5.0	3262		26404	10590		5276	24473	27744	1279
850107	5.0	2496		63704	29892		2867	54775	24736	631
850210	5.0	242	1734	15127	19033		4794	39109	68350	230
850304	5.0	12257	1711	1886	52293		25561	33064	74910	142
850401	5.0	34327		40889	26046	652	79515	24752	127749	488
850425	5.0	55634		42223	13237	333	57433	117570	102940	306
850512	5.0	7056		31770	6397	281	64852	128713	82699	
850512	5.0	26271		241	16108	219	162631	277246	103529	319
850522	0-30	5976		12726	8371	640	47711	267150	60958	74
850527	5.0	5598		22766	12412	116	44549	176599	71924	
850619	5.0	15111		29852	8223		21905	206962	43507	637
850619	0-30	7849		6790	12885		9300	150416	31112	106
850719	5.0	8236		4300	17361	29	33041	114653	10309	836
850731	0-30	13592	907	9511	13676	138	18866	161075	16656	240
850819	5.0	8774		19801	7898		5585	27118	240	5800
850819	0-30	19819		18604	28002	258	10691	68545	30175	1104
850826	.1	11181		18618	3258		19447	14146		57850
850923	5.0	11080		5020	45828		12750	80008	7432	4501
850923	0-30	15542		10653	17786		13005	60068	2962	10280
851205	5.0	5003			36160	33	4194	30371	5047	2228
851205	0-30	3408		1153	16575	27	1012	20083	8754	2619
860106	5.0	3448		9208	28324		9795	26263	33516	1518
860106	0-30	7345		502	18729	174	3989	17206	19694	645
860206	5.0	4636		3335	24335		5524	35546	35283	1475
860305	5.0	2822			21358		6289	13029	8380	114
860305	0-30	4016		10303	19906		14973	25405	28768	591
860403	5.0	2159		4816	19770		17775	28687	23013	174
860502	5.0	13130		2602	11056		79683	90069	9720	108
860606	5.0	13142		40308	15535		105037	187459	18497	1161
860702	5.0	18320		39584	18291		111149	387628	33893	169
860702	0-30	18716		53566	28383		119998	433577	40844	603
860730	5.0	2779		13592	28868	89	44411	31236	48052	666
860902	5.0	4079		15313	27886		28799	461	1998	12611

Chloro = Chlorophyceae
Eugleno = Euglenophyceae
Dino = Dinophyceae
Crypto = Cryptophyceae
Xantho = Xanthophyceae
Chryso = Chrysophyceae
Bacillario = Bacillariophyceae
Cyano = Cyanophyceae

Table B.5. Total phytoplankton biomass (um^3/ml) for discrete and integrated samples from the midlake deep site, Flathead Lake, Montana, 1983-1986.

date	depth (m)	total biomass
830126	5.0	44188.1
830302	5.0	24343.9
830413	5.0	105558.3
830504	5.0	164160.2
830531	5.0	194669.1
830725	0.1	321168.0
830725	10.0	410903.8
830725	20.0	626768.6
830831	5.0	48275.6
840131	5.0	472749.5
840305	5.0	133299.5
840403	5.0	180050.7
840501	5.0	325077.4
840515	5.0	174668.3
840524	5.0	213034.4
840625	5.0	323288.8
840724	5.0	237644.8
840807	5.0	139763.0
840905	5.0	115075.0
841002	5.0	250466.9
841112	5.0	148021.3
841212	5.0	101037.0
850107	5.0	179101.2
850210	5.0	148619.3
850304	5.0	201823.5
850401	5.0	334507.1
850425	5.0	389675.0
850512	5.0	321767.1
850512	5.0	586563.4
850522	0-30.0	403605.4
850527	5.0	333964.4
850619	5.0	326196.9
850619	0-30.0	218457.8
850719	5.0	188765.6
850731	0-30.0	235271.6
850819	0-30.0	177197.8
850819	5.0	75215.5
850826	0.1	124501.3
850923	5.0	166618.4
850923	0-30.0	130295.9
851205	5.0	83034.8
851205	0-30.0	53630.3
860106	0-30.0	68284.4
860106	5.0	112071.5
860206	5.0	110133.7
860305	0-30.0	103960.9
860305	5.0	51991.9
860403	5.0	96394.7
860502	5.0	206368.0
860606	5.0	381139.2
860702	5.0	609034.8
860702	0-30.0	695688.2
860730	5.0	169692.6
860902	5.0	90646.9

Table B.6. Dominant phytoplankton taxa (% of total biomass) for samples from the midlake deep site (5m, 0.1m and 0-30m integrated samples), Flathead Lake, Montana, 1985-1986. Taxa are listed in descending order of biomass concentration.

850619	0-30	Rhizosolenia eriensis (35)	Centrales (17)	Cyclotella sp. (16)	Tabellaria fenestrata (13)
850719	5.0	Centrales (48)	Dinobryon divergens (11)	Rhizosolenia eriensis (10)	
850731	0-30	Rhizosolenia eriensis (38)	Centrales (20)	Cyclotella sp. (10)	
850819	0-30	Rhizosolenia eriensis (21)	Centrales (14)	Cryptomonas ovata (13)	Fragilaria crotonensis (11)
850819	5.0	Centrales (30)	Hypnodinium sp. (26)	Cryptomonas ovata (9)	
850826	0.1	Anabaena flos-aquae (45)	Peridinium inconspicuum (12)	Mallomonas sp. (12)	Centrales (10)
850923	5.0	Centrales (44)	Cryptomonas ovata (22)		
850923	0-30	Centrales (37)	Cryptomonas ovata (12)	Rhizosolenia eriensis (9)	
851205	5.0	Cryptomonas ovata (25)	Rhizosolenia eriensis (22)	Cryptophyte flagellate (18)	
851205	0-30	Rhizosolenia eriensis (28)	Cryptomonas ovata (17)	Cryptophyte flagellate (13)	
860106	0-30	Rhizosolenia eriensis (20)	Asterionella formosa (16)	Cryptomonas ovata (13)	Cryptophyte flagellate (13)
860106	5.0	Rhizosolenia eriensis (17)	Cryptomonas ovata (15)	Fragilaria crotonensis (14)	Asterionella formosa (10)
860206	5.0	Rhizosolenia eriensis (30)	Asterionella formosa (21)	Cryptomonas ovata (15)	
860305	0-30	Asterionella formosa (16)	Rhizosolenia eriensis (15)	Cryptomonas ovata (10)	
860305	5.0	Cryptophyte flagellate (33)	Rhizosolenia eriensis (20)	Asterionella formosa (16)	
860403	5.0	Rhizosolenia eriensis (21)	Fragilaria crotonensis (20)	Cryptophyte flagellate (15)	Dinobryon divergens (13)
860502	5.0	Rhizosolenia eriensis (33)	Dinobryon cylindricum (20)	Dinobryon bavaricum (13)	
860606	5.0	Centrales (33)	Ochromonas sp. (22)	Rhizolsolenia eriensis (16)	
860702	5.0	Centrales (52)	Rhizosolenia eriensis (10)		
860702	0-30	Centrales (42)	Rhizosolenia eriensis (17)	Mallomonas pseudocoronata (9)	
860730	5.0	Centrales (17)	Fragilaria crotonensis (14)	Dinobryon divergens (11)	Cryptomonas ovata (10)
860902	5.0	Cryptomonas ovata (25)	Hypnodinium sp. (14)	Chrysocapsa planctonica (9)	

Table B.7. Hourly and daily integrated (i.e. 30m water column) estimates of primary productivity at the midlake deep site, Flathead Lake, Montana, 1984-1986. Values are means of duplicate samples ± 1.0 standard deviation.

date	$mgCm^{-3}hr^{-1}$		$mgCm^{-3}day^{-1}$		$mgCm^{-2}hr^{-1}$		$mgCm^{-2}day^{-1}$	
840228	1.200	(.090)	8.66	(.61)	35.98	(2.69)	259.8	(18.2)
840414	1.232	(.160)	11.15	(1.46)	36.94	(4.82)	334.4	(43.6)
840524	.816	(.013)	7.78	(.12)	24.48	(.38)	233.3	(3.6)
840801	.852	(.327)	9.96	(3.83)	25.54	(9.82)	298.8	(114.9)
840913	.767	(.102)	6.84	(.91)	23.01	(3.05)	205.0	(27.3)
841004	.998	(.104)	7.07	(.74)	29.92	(3.12)	212.0	(22.1)
841116	.689	(.067)	5.74	(.56)	20.68	(2.02)	172.0	(16.7)
850107	.360	(.044)	2.30	(.28)	10.78	(1.35)	68.9	(8.6)
850212	.314	(.198)	2.48	(1.56)	9.43	(5.93)	75.3	(47.4)
850308	.584	(.106)	5.21	(.94)	17.52	(3.18)	156.1	(28.4)
850501	1.304	(.145)	11.11	(1.24)	39.11	(4.34)	333.2	(37.0)
850522	1.008	(.020)	9.18	(.18)	30.22	(.62)	275.3	(5.7)
850619	1.405	(.257)	13.13	(2.40)	42.14	(7.71)	393.9	(72.1)
850719	1.414	(.293)	14.47	(3.00)	42.43	(8.80)	434.3	(90.0)
850819	1.173	(.121)	13.81	(1.42)	35.18	(3.63)	414.2	(42.7)
850920	1.933	(.099)	16.40	(.84)	57.98	(2.97)	492.0	(25.2)
851205	.565	(.091)	4.30	(.69)	16.94	(2.73)	128.8	(20.8)
860107	.313	(.135)	1.97	(.85)	9.38	(4.05)	59.0	(25.5)
860205	.612	(.119)	4.61	(.90)	18.35	(3.58)	138.3	(26.9)
860305	.254	(.036)	1.48	(.21)	7.62	(1.08)	44.4	(6.3)
860403	.711	(.155)	6.87	(1.50)	21.34	(4.66)	206.2	(45.0)
860417	.890	(.038)	5.38	(.23)	26.71	(1.15)	161.4	(7.0)
860502	.842	(.103)	5.86	(.72)	25.27	(3.10)	176.0	(21.6)
860515	.605	(.073)	5.24	(.63)	18.16	(2.19)	157.2	(18.9)
860606	1.342	(.114)	13.26	(1.13)	40.26	(3.43)	397.9	(33.9)
860702	1.568	(.141)	12.63	(1.14)	47.05	(4.24)	378.9	(34.2)
860730	1.213	(.241)	11.68	(2.32)	36.39	(7.23)	350.2	(69.6)
860904	.860	(.228)	7.34	(1.95)	25.80	(6.85)	220.2	(58.5)

Table B.8. Rotifer zooplankton collected by vertical haul with a 30 cm diameter, 64 micron mesh net at Midlake Deep. Data starting July, 1985 from 20 m to surface hauls, all data since then from 50 m to surface hauls. All data are expressed as organisms per liter.

	Asplanchna sp.		Conochilus natans		Filinia terminalis	
DATE	MEAN	STD DEV	MEAN	STD DEV	MEAN	STD DEV
840131	.04	.05	.35	.13	0	
840305	.06	.02	1.08	.01	.12	.08
840403	.01	.01	.67	.06	.16	.02
840501	.10	.01	2.03	1.16	.15	.08
840515	.38	.16	5.61	.33	.43	.23
840524	1.08	.28	4.41	.35	.49	.06
840625	2.32	.69	0		.23	.18
840724	.58	.02	0		0	
840914	.19	.11	0		0	
841002	.27	.01	0		.01	.01
841105	.89	.15	0		.26	.22
841212	1.08	.33	.04	.06	.65	.09
850107	2.28	.17	.07	.10	.23	.07
850210	1.36	.28	.27	.03	.06	.00
850304	.95	.35	.49	.14	.18	.02
850330	1.20	.29	1.72	.12	.21	.13
850425	1.11	.18	1.11	.24	.28	.07
850514	5.48	.66	4.47	.37	1.01	.46
850527	13.59	.81	11.87	4.20	.47	.67
850619	5.63	.21	.19	.12	2.43	.05
850719	0	0	0		1.03	.16
850819	0	0	0		.93	.24
850920	0	0	0		.31	.07
851205	0	0	0		.03	.01
860106	0	0	.08	.02	.07	.01
860205	0	0	0		.07	.02
860303	0	0	.09	.03	.03	.02
860403	0	0	.27	.05	.09	.01
860417	0	0	.35	.03	.13	.03
860502	0	0	.48	.02	.16	.01
860515	0	0	.21	.02	.38	.04
860528	0	0	.18	.07	.38	.25
860606	0	.01	.07	.02	1.28	.80
860702	0	0	0		1.20	.17
860730	0	0	0		2.16	.33
860904	0	0	0		.66	.03
861008	0	0	0		.21	.10
861103	0	0	0		.13	.11

Table B.9. Rotifers collected by vertical haul with a 30 cm diameter, 64 micron mesh net at Midlake Deep. Data starting July, 1985 from 20 m to surface hauls, all data since then from 50 m to surface hauls. All data expressed as organisms per liter.

	Gastropus stylifer		Kellicottia longispina		Keratella cochlearis	
DATE	MEAN	STD DEV	MEAN	STD DEV	MEAN	STD DEV
840131	.40	.15	1.52	.22	3.40	.81
840305	.45		2.17	.99	8.03	2.87
840403	.17	.12	2.34	.02	8.23	.35
840501	1.53	.35	5.39	1.41	31.07	.42
840515	4.33	.46	18.22	1.20	82.20	.25
840524	6.82	.16	29.54	.22	120.96	14.11
840625	9.44	.19	8.05	1.77	53.87	6.43
840724	2.62	.01	3.76	.11	16.38	1.65
840914	.29	.03	.57	.11	1.06	.05
841002	.78	.02	2.69	.15	2.25	.30
841105	1.25	.63	3.88	.94	4.67	.16
841212	.44	.09	4.26	.41	5.05	.32
850107	1.12	.05	4.82	.30	4.68	.50
850210	.37	.01	5.61	3.01	3.66	.03
850304	.21	.02	6.56	.02	4.83	.07
850330	.48	.07	11.96	.17	4.12	.04
850425	.05	.02	6.76	.29	4.10	.23
850514	.87	.18	14.83	.31	13.62	.49
850527	4.63	.45	30.79	.12	27.87	.89
850619	2.73	.78	13.30	.16	40.58	5.90
850719	.67	.24	2.17	.21	3.87	.07
850819	.32	.12	1.45	.40	1.23	.17
850920	.07	.03	.47	.12	.42	.04
851205	.14	.01	.71	.04	.53	.06
860106	.13	.09	.77	.09	1.06	.22
860205	.02	.01	.66	.01	.81	.01
860303	.09	.03	.92	.33	1.63	.27
860403	.12	.03	1.61	.47	1.89	.60
860417	.20	.02	1.81	.10	2.18	.45
860502	.86	.15	2.07	.20	3.12	.30
860515	.41	.02	1.63	.11	3.41	.20
860528	4.56	1.13	4.31	1.12	9.48	1.33
860606	8.05	1.82	5.10	1.48	10.87	1.79
860702	.63	.16	2.21	.05	1.68	.66
860730	.15	.10	2.01	.32	.92	.07
860904	.04	.00	.69	.30	1.40	.02
861008	.04	.00	.39	.14	1.11	.28
861103	.06	.00	.40	.16	.65	.10

Table B.10. Rotifers collected by vertical haul with a 30 cm diameter, 64 micron mesh net at Midlake Deep. Data starting July, 1985 from 20 m to surface hauls, all data since then from 50 m to surface hauls. All data expressed as organisms per liter.

	Keratella hiemalis		Keratella quadrata		Notholca acuminata/marina	
DATE	MEAN	STD DEV	MEAN	STD DEV	MEAN	STD DEV
840131	.02		.00	.00	.00	
840305	.00		.03	.01	.00	
840403	.06	.04	.00	.00	.00	
840501	.08	.03	.05	.02	.03	.05
840515	.31	.12	.19	.01	.00	
840524	.25	.10	.25	.03	.00	
840625	.01	.02	.06	.05	.00	
840724	.00		.14	.07	.00	
840914	.00		.01	.02	.00	
841002	.00		.00	.00	.00	
841105	.00		.02	.02	.00	
841212	.01	.02	.00	.00	.00	
850107	.04	.06	.03	.01	.00	
850210	.03	.05	.02	.02	.00	
850304	.11	.07	.02	.02	.00	
850330	.03	.04	.02	.02	.03	.05
850425	.11	.11	.02	.02	.07	.05
850514	.24	.06	.10	.07	.05	.00
850527	.00		.33	.10	.00	
850619	.00		.11	.15	1.08	.17
850719	.26	.14	.03	.00	.09	.04
850819	.05	.01	.04	.04	.24	.04
850920	.00	.01	.02	.00	.11	.04
851205	.00	.01	.01	.00	.02	.01
860106	.03	.01	.00		.17	.08
860205	.01	.01	.01	.01	.17	.05
860303	.05	.01	.00		.93	.37
860403	.05	.05	.00	.01	1.16	.27
860417	.06	.02	.01	.01	1.47	.02
860502	.12	.03	.01	.01	.78	.01
860515	.20	.01	.01	.01	.87	.01
860528	.43	.09	.03	.01	.59	.02
860606	.55	.14	.04	.00	.86	.35
860702	.38	.12	.04	.00	.01	.02
860730	.13	.07	.08	.06	.01	.01
860904	.02	.01	.06	.00	.09	.05
861008	.01	.02	.08	.04	.10	.06
861103	.02	.01	.12	.05	.07	.02

Table B.11. Rotifers collected by vertical haul with a 30 cm diameter, 64 micron mesh net at Midlake Deep. Data starting July, 1985 from 20 m to surface hauls, all data since then from 50 m to surface hauls. All data expressed as organisms per liter.

	Notholca squamula		Polyarthra		Unidentified rotifers	
DATE	MEAN	STD DEV	MEAN	STD DEV	MEAN	STD DEV
840131	.04	.05	3.67	.78	.15	.15
840305	.19	.27	4.87	3.85	1.09	.70
840403	.93	.07	5.91	.13	.49	.08
840501	4.35	.45	7.80	2.83	.64	.11
840515	30.34	2.65	12.00	4.84	2.21	.23
840524	41.94	9.07	23.37	6.26	6.00	1.06
840625	.73	.08	7.83	2.80	8.43	4.53
840724	.32	.18	7.46	.81	6.89	.95
840914	.00		.39	.09	1.05	.02
841002	.02	.03	1.06	.06	2.94	.83
841105	.00		7.10	1.79	3.74	.04
841212	.00		7.48	1.02	.70	.05
850107	.02	.03	15.55	4.28	1.35	.04
850210	.03	.00	9.09	1.09	.12	
850304	.03	.00	8.99	5.46	.03	
850330	.02	.02	14.57	.31	.00	
850425	.00		7.25	.50	.00	
850514	.02	.03	25.66	.65	5.40	.34
850527	.00		29.46	4.49	14.31	.02
850619	.05	.08	8.62	1.55	3.82	.78
850719	.00		1.82	.96	2.69	1.17
850819	.01	.01	.94	.08	1.06	.04
850920	.00	.01	.22	.04	.42	.04
851205	.00		.34	.13	.08	.01
860106	.00	.00	.19	.00	.10	.01
860205	.00		.07	.00	.11	.06
860303	.01	.01	.12	.04	.11	.01
860403	.01	.01	.21	.10	.26	.13
860417	.01	.01	.22	.01	.13	.02
860502	.04	.02	.47	.03	.49	.15
860515	.04	.02	.44	.08	1.30	.21
860528	.09	.00	2.58	.40	3.03	.26
860606	.21	.07	5.41	1.21	7.51	1.31
860702	.16	.08	1.29	.06	2.51	.01
860730	.06	.03	.54	.01	.97	.20
860904	.13	.01	.26	.21	1.20	.50
861008	.03	.03	.44	.15	.44	.06
861103	.07	.02	.21	.18	.42	.06

Table B.12. Cladoceran zooplankton collected by vertical haul with a 30 cm diameter, 64 micron mesh net at Midlake Deep. Data starting July, 1985 from 20 m to surface hauls, all data since then from 50 m to surface hauls. All data expressed as organisms per liter.

	Bosmina longirostris		Daphnia longiremis	
DATE	MEAN	STD DEV	MEAN	STD DEV
840131	.070	.070	.020	.040
840305	.110	.002	.090	.050
840403	.060	.060	.080	.030
840501	.190	.050	.420	.020
840515	.320	.140	.420	.210
840524	.290	.110	.850	.060
840625	1.530	.050	1.900	.220
840724	1.100	.030	.670	.180
840914	.480	.060	.170	.010
841002	1.480	.080	.050	.010
841105	1.830	.040	.030	.010
841212	.870	.240	.040	.000
850107	1.090	.130	.050	.002
850210	.610	.140	.080	.050
850304	.760	.010	.130	.040
850330	.750	.250	.060	.060
850425	.230	.040	.130	.010
850514	.430	.070	.230	.060
850527	.720	.110	.860	.010
850619	.390	.120	1.620	.130
850719	.200	.080	.460	.030
850819	.360	.020	.170	.020
850920	.150	.030	.020	.020
851205	.220	.030	.000	
860106	.100	.030	.000	
860205	.060	.050	.000	
860303	.100	.020	.000	
860403	.020	.000	.001	.001
860417	.020	.020	.001	.001
860502	.010	.010	.000	
860515	.010	.004	.003	.005
860528	.020	.020	.000	
860606	.040	.010	.000	
860702	.070	.040	.000	
860730	.330	.100	.000	
860904	.120	.060	.000	
861008	.002	.003	.000	
861103	.010	.004	.000	

Table B.13. Cladoceran zooplankton collected by vertical haul with a 30 cm diameter, 64 micron mesh net at Midlake Deep. Data starting July, 1985 from 20 m to surface hauls, all data since then from 50 m to surface hauls. All data expressed as organisms per liter.

	Daphnia thorata		Leptodora kindtii	
DATE	MEAN	STD DEV	MEAN	STD DEV
840131	.000		.0000	
840305	.000		.0000	
840403	.000		.0000	
840501	.270	.100	.0000	
840515	.390	.060	.0000	
840524	.250	.010	.0020	.0020
840625	2.790	.200	.0010	.0010
840724	2.470	.540	.0060	.0060
840914	.360	.060	.0000	
841002	1.200	.340	.0040	.0030
841105	.880	.210	.0010	.0010
841212	.110	.020	.0000	
850107	.070	.050	.0000	
850210	.010	.010	.0000	
850304	.010	.010	.0000	
850330	.140	.001	.0000	
850425	.110	.070	.0000	
850514	.270	.160	.0000	
850527	.200	.030	.0011	.0010
850619	.750	.020	.0014	.0010
850719	.800	.040	.0024	.0014
850819	.310	.020	.0003	.0003
850920	.200	.010	.0000	
851205	.020	.010	.0000	
860106	.000	.000	.0000	
860205	.000		.0000	
860303	.000		.0000	
860403	.010	.005	.0000	
860417	.003	.002	.0000	
860502	.010	.020	.0000	
860515	.010	.004	.0000	
860528	.001	.000	.0000	
860606	.001	.001	.0000	
860702	.220	.040	.0000	
860730	.780	.004	.0000	
860904	.370	.010	.0000	
861008	.021	.0003	.0000	
861103	.003	.000	.0000	

Table B.14. Copepod zooplankton collected by vertical haul with a 30 cm diameter, 64 micron mesh net at Midlake Deep. Data starting July, 1985 from 20 m to surface hauls, all data since then from 50 m to surface hauls. All data expressed as organisms per liter.

	Leptodiaptomus ashlandii copepodites		Diacyclops thomasi copepodites		nauplii	
DATE	MEAN	STD DEV	MEAN	STD DEV	MEAN	STD DEV
840131	1.17	.48	3.29	.44	5.77	1.09
840305	3.28	.28	3.26	1.12	7.03	1.94
840403	2.68	.41	1.35	.23	6.52	.07
840501	3.73	.27	1.67	.69	10.55	1.06
840515	6.59	2.57	1.04	.22	14.52	11.49
840524	9.99	.73	1.39	.72	30.39	1.06
840625	8.37	.76	3.43	.32	20.46	2.98
840724	3.47	.24	3.18	.38	19.61	.16
840914	1.50	.17	.74	.10	3.05	.80
841002	2.28	.25	2.88	.15	2.36	.20
841105	2.93	.76	4.14	.32	3.87	.51
841212	.67	.03	2.77	.02	5.24	.17
850107	1.42	.08	4.74	.15	6.76	.71
850210	1.36	.24	3.51	1.06	11.48	.13
850304	1.65	.06	3.86	.38	10.99	1.07
850330	3.13	.41	1.92	.05	15.00	.82
850425	3.25	.33	.87	.03	11.32	1.51
850514	10.36	.54	2.16	.25	28.74	.74
850527	31.04	1.56	.93	.16	52.94	2.36
850619	20.95	.59	.91	.06	16.34	.47
850719	6.94	.88	.45	.05	15.24	2.01
850819	4.92	.64	.26	.01	5.11	.21
850920	1.04	.22	.23	.01	1.68	.30
851205	.32	.01	.91	.07	.96	.24
860106	.25	.02	.95	.03	1.76	.44
860205	.22	.08	.39	.15	3.21	.08
860303	.79	.44	.96	.02	9.01	.22
860403	.57	.01	.42	.06	7.89	1.38
860417	1.46	.07	.31	.00	8.47	.21
860502	3.70	.27	.21	.02	7.24	.46
860515	3.23	.51	.06	.03	6.96	.51
860528	6.97	.38	.17	.01	10.43	2.88
860606	7.96	2.79	.17	.04	14.14	.26
860702	5.78	.00	.48	.14	14.88	3.46
860730	6.18	.50	.61	.23	6.33	.05
860904	2.48	.17	.90	.02	1.99	.03
861008	1.47	.09	1.10	.03	1.21	.23
861103	.71	.11	.84	.17	.84	.23

Table B.15. Copepod zooplankton collected by vertical haul with a 30 cm diameter, 64 micron mesh net at Midlake Deep. Data starting July, 1985 from 20 m to surface hauls, all data since then from 50 m to surface hauls. All data expressed as organisms per liter.

	Leptodiaptomus ashlandii adults		Diacyclops thomasi adults		Epischura nevadensis	
DATE	MEAN	STD DEV	MEAN	STD DEV	MEAN	STD DEV
840131	.64	.29	.33	.18	.0020	.0000
840305	1.16	.02	.39	.09	.0010	.0010
840403	.40	.18	.98	.32	.0000	.0000
840501	1.29	.29	.00		.0000	.0000
840515	1.04	.18	1.42	.06	.0000	.0000
840524	1.21	.04	1.34	.28	.0010	.0010
840625	2.14	.81	.09	.12	.0140	.0130
840724	.51	.32	.55	.29	.0030	.0010
840914	.16	.09	.13	.11	.0170	.0030
841002	.40	.01	.24	.08	.0140	.0060
841105	1.06	.33	.33	.12	.0100	.0060
841212	1.42	.02	.24	.09	.0030	.0040
850107	2.90	.18	.46	.11	.0180	.0010
850210	1.49	.02	.35	.04	.0010	.0010
850304	2.12	.46	1.36	.29	.0020	.0030
850330	1.55	.33	.93	.41	.0000	.0000
850425	1.03	.21	.56	.10	.0000	.0000
850514	1.84	.30	1.33	.41	.0000	.0000
850527	3.19	1.02	1.26	.06	.0010	.0010
850619	2.01	.06	.19	.12	.0400	.0600
850719	.45	.12	.17	.11	.0074	.0030
850819	.23	.01	.12	.04	.0400	.0200
850920	.05	.04	.02	.00	.0100	.0000
851205	.90	.23	.06	.02	.0200	.0000
860106	.84	.12	.04	.02	.0011	.0007
860205	.71	.01	.71	.01	.0002	.0003
860303	1.11	.13	.09	.01	.0030	.0030
860403	.74	.01	.23	.03	.0000	.0000
860417	.98	.18	.39	.10	.0000	.0000
860502	.62	.12	.44	.08	.0000	.0000
860515	.27	.03	.19	.02	.0000	.0000
860528	.51	.07	.35	.11	.0003	.0004
860606	.70	.10	.25	.02	.0006	.0020
860702	.54	.24	.20	.04	.0030	.0030
860730	.17	.12	.07	.04	.0500	.0400
860904	.16	.07	.09	.01	.0200	.0030
861008	.13	.00	.04	.02	.0050	.0030
861103	.77	.08	.09	.03	.0110	.0090

Table B.16. Total zooplankton collected by vertical haul with a 30 cm diameter, 64 micron mesh net at Midlake Deep. Data starting July, 1985 from 20 m to surface hauls, all data since then from 50 m to surface hauls. All data expressed as organisms per liter.

DATE	MEAN	STD DEV	C. V.
840131	20.88	n.a.	n.a.
840305	31.75	10.57	.33
840403	30.98	.10	.00
840501	71.28	1.80	.03
840515	182.29	19.29	.11
840524	280.88	2.21	.01
840625	131.86	18.34	.14
840724	68.43	1.16	.02
840914	10.17	.78	.08
841002	20.90	.75	.04
841105	36.86	3.26	.09
841212	31.11	2.68	.09
850107	47.68	2.18	.05
850210	39.89	6.48	.16
850304	43.15	8.10	.19
850330	57.13	.63	.01
850425	38.29	1.87	.05
850514	117.11	1.20	.01
850527	224.43	2.14	.01
850619	121.75	8.07	.07
850719	37.37	5.39	.14
850819	17.76	1.02	.06
850920	5.45	.94	.17
851205	5.27	.07	.01
860106	6.56	.57	.09
860205	6.55	.37	.06
860303	16.05	1.34	.08
860403	15.57	2.73	.18
860417	18.19	1.15	.06
860502	20.28	.05	.00
860515	19.64	1.78	.09
860528	24.14	3.04	.13
860606	63.22	11.63	.18
860702	32.30	4.69	.15
860730	21.54	.08	.00
860904	10.67	1.33	.12
861008	6.84	1.22	.18
861103	5.44	1.15	.21

SECTION C

FISHERIES MANAGEMENT

Fisheries Management Data collected by the Montana Department of Fish, Wildlife and Parks, 490 N Meridian Rd., Kalispell, MT 59901 and Flathead National Forest, United States Forest Service, 1935 3rd Ave E, Kalispell, MT 59901.

Introduction

Fishery management in the Flathead drainage spans more than eight decades with initial efforts focused on introduction or augmentation of fish stocks with hatchery fish and the setting and enforcement of seasons and bag limits. Present day fishery management has shifted to emphasize naturally reproducing fish stocks by emphasizing habitat and water quality preservation, fish population monitoring, and regulation of harvest through seasons and bag limits. Management has become more species specific, with emphasis on native fish stocks, as more is learned about life history and habitat requirements. Native gamefish species include westslope cutthroat, bull trout (Dolly Varden), and mountain whitefish. Popular introduced gamefish include kokanee salmon, lake trout, rainbow trout, eastern brook trout, lake whitefish, and yellow perch. Kokanee receive a major portion of management efforts because of their popularity with fishermen, accounting for more than half the fishing pressure exerted in the Flathead each year.

Management is an interagency effort requiring cooperation among the Flathead National Forest (FNF), Montana Department of Fish, Wildlife, and Parks (MDFWP), and Confederated Salish and Kootenai Tribe (CS&KT). The U. S. Fish and Wildlife Service (USFWS) provides technical support to CS&KT. Additional funding for studies by MDFWP has been provided by the Bonneville Power Administration, Bureau of Reclamation, and Environmental Protection Agency. Technical assistance has been provided by Montana State University and the University of Montana. The FNF concentrates on physical habitat management while MDFWP and CS&KT manage the fisheries directly. In 1985, consensus was reached on the final Flathead Basin Monitoring Plan and commitment made by all agencies to use every means available to collect the data despite limited budgets. Management efforts include research and monitoring in the following forms:

1. Stream channel ratings, substrate scores, gravel composition and other stream components (e.g. pool/riffle ratios, cover) to measure changes in physical habitat.
2. Redd (spawning nest) counts and spawner counts for trout and salmon to measure survival through spawning.
3. Population and abundance estimates to measure fish stock abundance.
4. Creel census to measure angler effort and harvest on certain fisheries.

From 1981 to 1985, various levels of fisheries monitoring have been conducted in the basin and some of the results will be reported here. Much of the 1986 data is still being analyzed, but some of the results will be made available in this report.

Results and Discussion

Bull Trout

Bull trout are the largest fish native to the Flathead drainage, attaining lengths of 36 inches or more and maximum weights above 20 pounds. Bull trout exhibit one of the more spectacular adfluvial (lake to stream) spawning runs in the state, migrating up to 120 miles to tributary spawning streams. Spawning typically occurs in September and early October. Young bull trout rear 1 to 3 years in the tributaries before dropping down to Flathead Lake. They mature in the lake and return to the streams at age 6 or 7 to spawn. Bull trout are currently listed as a species of special concern by the MDFWP because of apparent declines in abundance and distribution. Bull trout are also designated as an indicator species in the Flathead Forest Plan (USDA 1986) because of their sensitivity to changes in streambed condition, water temperature, and cover.

Redd Counts

Redd counts are an index of the number of adults that successfully spawn in each stream each year and, as such, are an indicator of overall survival in the population. These counts can also be used to compare in part the spawning and rearing conditions among tributaries since it is assumed most bull trout return to their natal stream (birthplace) to spawn.

Bull trout redds appear as depressions and mounds of cleaned gravel which are readily identifiable by trained observers. Redd counts on selected tributaries have averaged 360 over the past 8 years, peaking at 600 in 1982 (Table C.1). The 1982 peak count was due to a strong year class that reflected in part good spawning and rearing conditions in 1975-76. Spawning occurs in both the North and Middle Fork drainages of the Flathead with a small majority in the North Fork. Redd counts were generally low in all of the Flathead drainage in 1985 due to extremely low summer flows impeding fish migration and subsequent record high flows in the fall obscuring many redds for the count. The 1986 redd count was slightly above average with numbers down slightly (16 percent) in the North Fork but up 17 percent in the Middle Fork (Table C.1). In particular, Coal Creek in the North Fork showed reduced counts (down 70 percent) while Lodgepole Creek in the Middle Fork showed the most increase (75 percent). Coal Creek is the site of a cooperative study funded by the FNF to study the effects of logging practices on bull trout (Weaver and White, 1985).

Bull trout average 3.2 fish per redd so the 1986 count represents 1235 fish spawning in the selected reaches that are

monitored each year. The total spawning population based on drainage-wide redd counts in 1980, 1981, and 1982 averages 3,400 bull trout per year and, since it is assumed that 30-50 percent of the spawning run is lost to angler harvest or other mortality before spawning, represents a total spawning run of 6,000-7,000 fish.

The South Fork of the Flathead and the Swan River were originally part of the Flathead migratory system also. The South Fork was blocked by construction of Hungry Horse Dam in 1951, resulting in a substantial reduction in the bull trout population in Flathead Lake (Fraley and Shepard, 1986). The Swan River was blocked by construction of Bigfork Dam in 1902. A fish ladder on the dam provides only marginal fish passage. Both systems have developed their own internal spawning populations of bull trout. The Swan drainage has been monitored since 1982 as a result of a study of 22 proposed microhydro projects (Leathe and Enk, 1985). The 1986 redd count of 210 (Table C.2) was very close to the 5-year average of 208 redds. Based on redd counts, the four streams provide 90 percent of the bull trout spawning in the Swan drainage and therefore were closed to all fishing in 1984 to maintain the population.

Juvenile Populations

Populations of juvenile bull trout have been monitored in selected tributaries as described in Shepard and Graham (1982) to measure survival. Electrofishing surveys have been conducted most consistently in two important rearing streams: Coal Creek in the North Fork and Morrison Creek in the Middle Fork. Fish populations were estimated in specific stream sections 164 yards long. Results of this monitoring are given in Table C.3.

A considerable amount of logging has occurred on state and national forest land in the Coal Creek basin, and additional timber sales are scheduled for this decade. For the last five years, the Coal Creek fish inventories have been conducted as part of a cooperative study by FNF, MDFWP, and Montana State University. Bull trout populations have been monitored annually in two sections of Coal Creek since 1982 and one section of South Fork Coal Creek since 1985 (Weaver and White, 1985; Weaver and Fraley, 1986).

Although the population estimates often overlap among years, the numbers of juvenile bull trout seem to reflect trends in number of spawning adults during two to three years previous, as indicated by redd counts. It therefore appears that Coal Creek could produce more young bull trout if egg/embryo survival improved (see next section) or if more adult fish returned to spawn. Nevertheless, Coal Creek continues to support relatively high densities of juvenile bull trout. Populations have been highest at the Dead Horse Creek Road bridge site, which is

affected by timber management in the Coal Creek State Forest as well as the FNF.

The population of juvenile bull trout in Morrison Creek has been fairly stable over the last seven years (Table C.3). During the same period no additional development has occurred in this drainage. One significant decline in juvenile abundance was observed in 1983 but populations returned to previous levels by 1985.

Juvenile bull trout populations have also been measured in other streams in the North Fork (Whale, Big), Middle Fork (Ole), South Fork (Hungry Horse), and Swan (Lion, Goat, Elk, Squeezer) drainages. The highest densities of bull trout have been measured in Whale, Coal, and Elk creeks, perhaps in part reflecting better juvenile rearing conditions in those streams.

Spawning Gravel

The condition of stream gravels used by spawning bull trout has been sampled in various tributaries of the upper Flathead Basin over the last few years. Coal Creek has the most complete record with samples beginning in 1981. Additional sampling sites were established in North Fork tributaries during 1985, and in four tributaries of the Swan River during 1986. Also sampled in 1986 was a spawning area in Granite Creek which had been previously sampled in 1982 by MDFWP. Sampling methods are described by Shepard and Graham (1983).

As a major tributary to the North Fork of the Flathead river, Coal Creek provides about 11 percent of the spawning habitat for bull trout from Flathead Lake. A 1982 survey found spawning gravels in Coal Creek to have significantly more sediment than three other spawning streams in the North Fork. Consequently, efforts have been focused on this stream to study the effect of sediment on bull trout embryo survival and to monitor changes in fish habitat resulting from upstream road building and logging.

The Coal Creek study has already demonstrated that increased sediment in spawning gravels results in decreased survival of bull trout eggs (Weaver and White, 1985). In fact, bull trout egg survival can be predicted from the percentage of material smaller than 1/4 inch in the spawning gravel. Therefore, this size class of material can be used as an index of substrate quality in bull trout spawning streams.

Substrate sampling in Coal Creek was accomplished at three locations in known bull trout spawning areas. Beginning in 1981, a sampling station was established on main Coal Creek about 9 miles above the mouth in the vicinity of the Dead Horse Road

bridge. This station has been retained as a permanent sampling site. In 1985, additional sampling sites were established further upstream in spawning areas above the road #317 bridge and also in the South Fork of Coal Creek. It was determined that annual duplication of exact coring sites was not necessary as long as selected sampling sites were in the same vicinity and appeared similar to areas used during spawning.

Percentages of substrate material smaller than 1/4 inch at the Dead Horse Creek bridge site from 1981 through 1985 are displayed in Table C.4. Although additional road construction and logging took place over this period, there were no statistically significant changes in sediment at the Dead Horse spawning site. However, no pre-1981 data exist for evaluating the long-term effect of development on this basin. Likewise, the absence of information from past years prevented comparisons at the two newly established stations. Results of the 1985 Coal Creek core sampling did show that the main Coal Creek station above the road #317 bridge contained the least amount of fine materials (Table C.5).

Streambed gravels at the Dead Horse site averaged 35 percent fine material (<1/4 inch) from 1981 to 1985. This translates into an expected survival rate of 44 percent for bull trout eggs, which indicates the depressing effect of sediment on bull trout reproduction in Coal Creek. However, the impact on adult bull trout populations is more difficult to evaluate because other factors may limit survival of juvenile fish to maturity (e.g., predation, competition, angling).

A five-year record of spawning site condition in North Fork tributaries is given in Table C.6. All four streams showed increases in fine material from 1981 to 1983, but no consistent trends since then. Of the four streams, Whale Creek has experienced the most erratic changes in sediment levels. This may be due to the nature of the monitoring site, which seems to be altered by spring runoff more than the other stations. To date, it has been difficult to quantify the effects of road development and logging on these monitoring sites because of the large amount of natural variation that takes place annually in the system. As the record grows and is better integrated with water quality monitoring, more specific interpretations will be possible.

The results of gravel sampling at spawning sites in the North Fork drainage during 1985 are summarized in Figure C.1. As inferred from the graph, expected bull trout egg survival ranged from 76 percent for Trail Creek to 35 percent for South Fork Coal and Upper Whale creeks. The survival levels needed to sustain the bull trout fishery are unknown, but it is felt that production of juveniles is below potential in many areas.

During 1986, substrate sampling was begun in bull trout spawning streams in the Swan River drainage and continued at most of the previously established stations in the upper Flathead system. At this time, the samples are still being analyzed.

Substrate Score

Substrate quality was monitored in several important juvenile bull trout rearing areas by means of a visual estimate called "substrate score". In the Swan River study, substrate score was found to be a useful index of juvenile bull trout habitat quality (Leathe and Enk, 1985). The rating technique, which is a combined ranking of streambed particle size and embeddedness, may provide a simpler alternative to core sampling in very remote areas. For Flathead Basin monitoring, substrate scores were calculated according to the modified procedure used in the Swan study. The scores may range from a high of 17.0 for clean bedrock and boulder substrates to a low of 3.0 for completely silted streambeds. Streams with substrate scores of 11.0-15.0 are believed to provide the best rearing habitat for bull trout.

We have chosen to score substrates in the same stream sections where juvenile bull trout populations were estimated by electrofishing. This will enable us to compare changes in habitat quality with changes in fish populations. During 1985, substrate scores were measured for three sites on Coal Creek: Dead Horse bridge, main Coal Creek above South Fork bridge, and South Fork Coal Creek. Scores were again calculated for the Coal Creek stations in 1986. In addition, two new sites were scored, one on Big Creek and one on Morrison Creek. Average substrate scores for 1985 and 1986 are displayed in Table C.7.

In the Swan River study, streams with substrate scores less than 9.0 were found to support fewer than five juvenile bull trout per ~~100~~ 138 m^2 (Leathe and Enk, 1985). Until further analysis, this value (9.0) may be considered a critical standard against which substrate scores can be judged. Additionally, a drop of two or more points in any substrate score should be considered cause for concern. Natural and/or manmade sediment sources responsible for such an occurrence should be identified and mitigation undertaken if possible. Our limited monitoring to date has not detected a problem with this component of fisheries habitat. Substrates scores rose slightly from 1985 to 1986 in two Coal Creek stations while decreasing at the South Fork station. None of these changes was deemed significant.

Creel Census

Bull trout are a popular gamefish with angler harvest averaging 7,000 or more fish per year in the drainage. Creel

censuses require high expenditures of money and manpower so estimates are limited but harvest and use appear to be stable at this time (Table C.8). The creel limit for bull trout was reduced to 1 fish per day for the entire Flathead drainage in 1984 to control overall harvest.

A bioeconomic survey (Leathe and Enk, 1985) in the Swan drainage showed that bull trout were prized more highly than general "trout" with anglers willing to pay up to $450 per party-trip to fish specifically for bull trout. Although subject to the limitations of this bioeconomic theory, this analysis estimated that fishermen valued this bull trout fishery at $232,000 annually.

Westslope Cutthroat Trout

Westslope cutthroat form both resident and migratory populations in the drainage. Adfluvial cutthroat live in Flathead Lake and migrate to streams to spawn. Fluvial cutthroat live in large rivers and migrate to small streams to spawn. Resident cutthroat live in small streams or the headwaters of rivers year round. Spawning typically occurs in spring or early summer. Adfluvial juvenile cutthroat rear in streams 1 to 3 years before migrating to the lake where they mature. Because of their complex life cycle and the fact that they spawn during the spring when sampling is difficult, less is known about the life history of westslope cutthroat than other species. Westslope cutthroat trout are listed as a species of special concern by MDFWP because of declines in distribution and abundance. The species is also designated as an indicator species in the Flathead Forest Plan.

Redd Counts and Spawner Counts

Because spawning occurs just before or during high spring flows, it is difficult to count redds. The number of spawning adults using Hungry Horse Creek in the South Fork drainage has been determined by trapping (Table C.9).

The Hungry Horse Creek runs have declined greatly in recent years. Reservoir operation, road construction, and timber harvest appear to be major factors in the decline.

Population Estimates

Cutthroat trout populations have been monitored in Challenge Creek (Middle Fork tributary), Coal Creek (North Fork tributary, and other streams (Table C.10) as described by Shepard and Graham

(1983). Of these few streams, Challenge Creek appears to be one of the more important juvenile rearing streams in the Flathead system. The Challenge Creek estimates will be used to establish natural population variation with which to evaluate the effects of future resource development.

In Coal Creek, cutthroat trout populations have remained at a fairly stable but low level over the last five year. An experimental planting of over 90,000 fingerling cutthroat in late 1982 increased 1983 densities but failed to have a lasting effect on the population at the Dead Horse bridge site.

Numbers of adult cutthroat trout have been estimated for various sections of the South Fork of the Flathead River (Table C.11). Due to demand by the public, which perceived a decline in both the number and size of cutthroat trout, various restrictive angling regulations were placed on the river in 1984. The regulations were intended to eliminate all harvest in the Harrison section and to eliminate harvest on trout larger than 12 inches in the wilderness. The program will be continued through 1987 to evaluate the effectiveness of the regulations. Anglers have reported improved fishing throughout the wilderness since restrictive regulations were established. Densities of trout appear to also be a function of habitat and fish migration.

Spawning Gravel

In 1986, important cutthroat spawning sites in Hungry Horse Creek, which flows into Hungry Horse Reservoir, and Challenge Creek, in the Middle Fork drainage, were sampled for gravel composition. Also in 1986, gravel areas in Fish Creek which provide critical spawning habitat for cutthroat-rainbow hybrids from Ashley Lake were sampled for the first time. These samples are currently being analyzed.

Creel Census

Although cutthroat trout are overshadowed by more popular gamefish, they still provide a harvest of 30,000-50,000 fish each year in the drainage (Table C.8). The majority of the harvest occurs in the three main forks of the Flathead.

Genetic Surveys

Pure westslope cutthroat are declining in abundance and distribution due to changes in habitat and hybridization with introduced species such as rainbow and Yellowstone cutthroat trout. MDFWP has conducted an intensive stream survey in the Flathead drainage using analysis at the genetics laboratory at

the University of Montana to test for genetic purity. Of 46 streams tested in the South Fork, 12 streams have hybridized populations, 27 streams have pure populations that are threatened with hybridization, and only 7 streams have pure populations that are isolated by falls, culverts, or other barriers. Similarly, in the North Fork drainage, 3 of 19 streams had hybrid populations, 11 populations were pure but threatened, and 5 populations were pure and considered secure. An interagency westslope cutthroat recovery program is currently being developed. Four lakes in the Jewel Lakes Basin (South Fork drainage) were chemically treated in 1986 to remove rainbow trout and replanted to native westslope cutthroat.

Kokanee Salmon

Kokanee were accidentally introduced into the Flathead drainage in the early 1900's in a plant of other fish. The kokanee expanded to fishable populations by 1930 and now account for most of the fishing pressure and harvest in the Flathead drainage. Kokanee migrate up the Flathead River each fall to spawn in the mainstem, tributaries to the Middle Fork, the lower South Fork, and McDonald Creek (Figure C.2). The spawning concentration in McDonald Creek annually attracts the largest concentration (up to 600) of bald eagles in the lower continental United States (Figure C.3). The combination of eagles and salmon has proven to be a popular tourist attraction with 50,000-60,000 viewers each year. The eggs and fry overwinter in the gravels, and the fry migrate to the lake in the spring. The salmon remain in the lake an average of 4 years before they mature and migrate up the river to their birthplace to spawn and die. It is estimated that kokanee spawning runs totalled 300,000 fish per year in the early 1970's, but runs have declined in recent years due to a combination of habitat problems, harvest, and other factors.

Kokanee are currently being managed to produce a population density that will produce adult fish averaging 12-13 inches in length and producing a summer catch rate of 1 fish/hour and a spawning run of 300,000 fish. Average kokanee size decreases as densities increase and competition for food increases. Adult fish are currently averaging 14-15 inches in length and spawning runs are averaging 40,000-150,000 fish so population densities are still below the management goal.

Spawner Counts

A combination of redd counts and actual counts of spawners has proven to be a reliable indicator of the strength of spawning runs in the Flathead system (Table C.12). The main Flathead

River and the Flathead lakeshore provided significant portions of the spawning in past years, however, fluctuations in the river due to releases from Hungry Horse Dam have dramatically reduced spawning success and subsequent spawning runs in recent years (Fraley and Graham, 1982). Similarly, fluctuations in the levels of Flathead Lake for power production appear to be partially responsible for declines in lakeshore spawning (Decker-Hess and McMullin, 1983). The Flathead lakeshore once produced up to half the spawning in the drainage, but now provides only 3 percent of the total. McDonald Creek, which is unregulated and relatively free of habitat disturbance due to its location in Glacier National Park, now provides the majority of spawning in the Flathead.

The 1985 spawning run, primarily offspring of the strong 1981 spawning run, was the highest number of spawners on record. By contrast, the 1986 run, which are offspring of the 1982 year class which was the lowest run ever recorded, appears to be similarly weak although counts have not been completed at this time. Agreements with the Bureau of Reclamation to provide minimum flow releases from Hungry Horse Dam are helping the recovery of spawning populations in the main Flathead River as evidenced by increased spawner counts in recent years (Table C.12). However, it will take several more population cycles to allow weak year classes to recover and stabilize the population.

Creel Census

Kokanee are the most popular gamefish in the Flathead, accounting for 90 percent or more of angler pressure and harvest with 300,000 to 500,000 salmon caught each year. Anglers typically begin to harvest a year class of salmon as 3-year old subadult fish in the winter fishery (Table C.13). Harvest then intensifies through the following summer as the fish mature and school up prior to their spawning migration. Harvest can occur during the fall spawning run but has been limited in recent years to maximize the number of spawning adults. Snagging was eliminated after it was shown that this method could harvest up to 50 percent of the spawning run.

Fishing harvest peaked in the early 1970's and then dropped as salmon populations declined. Fishermen enjoyed moderate fishing success in 1981 and 1984 but cold lake water temperatures in 1985 dispersed the salmon and provided only a fair harvest. Cold water temperatures and a weak 1982 year class provided very poor fishing during summer, 1986.

The winter fishery has traditionally accounted for only 10-20 percent of the annual harvest but has gained attention in recent years due to concentrations of kokanee and fishermen in Skidoo Bay in the southeast corner of the lake. Concentrations

of up to 475 anglers in a small area have harvested salmon at a high rate of 3-5 fish per hour per angler. Estimated harvest for one two-week period in January, 1986 was 22,000 salmon. The MDFWP and CS&KT have jointly managed the fishery for the last 3 years by closing the fishery when total harvest approaches 50,000 salmon (Table C.13).

The current salmon fishery at reduced levels is still estimated to be worth $2.8 million annually to the local economy. It is estimated that a recovered salmon population will be worth more than $8 million annually.

Acoustic Counts

Salmon populations in Flathead Lake are monitored with hydroacoustic equipment. More than 70 miles of transects are measured each fall to yield estimates of the density of salmon (Table C.13). Densities are measured as "small" subadult salmon (less than 10 inches) and "large" or adult salmon (longer than 10 inches) which will spawn that fall. Although there appears to be a weak relationship between densities of "small" fish one year and "large" fish the following year, harvest appears to have a profound effect on the number of small fish that ultimately survive to spawn. Current research is aimed at developing methods of estimating abundance of one or two-year old salmon so that subsequent management (fishing regulations) can be tailored to fit year class strength.

Additional Monitoring

Lake Trout

Lake trout were introduced in Flathead Lake in 1905 and now provide a popular trophy fishery. A 1981 creel census estimated an annual harvest of just under 7,000 fish while at 1985 census estimated 1,600 fish were captured in 3 summer months (Table C.14). Lake trout are the largest fish in the lake with many fish in the 20-30 pound range caught each year and the state record of 42 pounds caught in 1979. Lake trout fishing requires specialized fishing gear and large boats so it is not available to all fishermen. Several commercial guides provide fishing trips on the lake.

Lake trout reside in the lake year round and spawn in 10-40 feet of water along rocky shorelines in late October and November. Young lake trout feed on a variety of insects, zooplankton, and small fish. Larger trout feed almost exclusively on fish, primarily kokanee and whitefish (Leathe and Graham, 1982). Mysis shrimp appear to be becoming an important food item as mysis densities increase.

Yellow Perch

Yellow perch were introduced in the early 1900's and now produce a popular sport fishery due to their good eating qualities. Polson Bay at the east end of Flathead Lake appears to be a major spawning area and also sustains the bulk of angling use. Perch populations appear to be expanding with increased numbers of fish observed in a variety of areas around the lake. The Confederated Salish and Kootenai Tribe is studying the impacts of Kerr Dam operations on yellow perch under studies funded by the Bonneville Power Administration.

Mysis

Mysis shrimp have attracted recent attention because of their potential for impacting fish and plankton communities in the Flathead system. Mysis were introduced into several lakes in northwest Montana in 1968, 1975, and 1976 in an attempt to supplement the food base for trout and salmon. Mysis appeared to be a major factor in producing kokanee weighing over 4 pounds in Kootenay Lakes, British Columbia. Unfortunately, similar positive effects have not been observed in Montana. Mysis migrate to the surface waters at night when salmon are not feeding and the shrimp feed on the zooplankton commonly utilized by kokanee. The mysis then retreat during the daytime when salmon are feeding to depths not commonly occupied by kokanee. Rather than supplementing salmon diets, therefore, the mysis are competing with salmon for the same food base. This interaction can either reduce growth rates for juvenile and adult salmon or result in outright mortality to juvenile salmon through starvation or predation by mysis.

Six lakes (Table C.14) are currently being monitored to determine mysis densities and evaluate their potential effects on kokanee populations (Rumsey, 1985). The relationship between mysis and kokanee is not clear with Ashley, Little Bitterroot, and Swan Lakes all supporting large numbers of salmon despite a wide range of mysis densities. The lakes support popular recreational fisheries although the salmon are small due to stunting or competition with mysis. On the other hand, the kokanee populations in McGregor and Whitefish lakes collapsed completely after the introduction of mysis even though McGregor Lake has one of the lower measured densities of mysis.

Mysis were not introduced directly into Flathead Lake but first appeared in 1981, apparently drifting downstream from Whitefish or Swan Lake. They are currently increasing at a very rapid rate, numbering more than 130 per square meter of surface area in summer 1986. Intensive studies of mysis population dynamics in Flathead Lake are currently being conducted by the University of Montana Biological Station at Yellow Bay on

Flathead Lake and MDFWP studies are being redirected to define mysis impacts on young kokanee and other fish species. While some impact on kokanee is certain to occur, it is still not clear whether this will show as reduced growth rates, reduced densities, or both. Other fish species in Flathead Lake which feed in deeper water such as lake trout, bull trout, and pygmy and lake whitefish are able to prey on mysis and will probably show increased growth and/or densities at some life stages.

Other Waters

Additional fisheries monitoring is ongoing on these additional waters in the Flathead drainage at this time:

Ashley Lake and tributaries (FBC 5004)
Hungry Horse Reservoir (FBC 2010)
Lake Mary Ronan (FBC 5019)
Swan Lake (FBC 6007)
Tally Lake (FBC 4008)
Whitefish Lake (FBC 4018)

The information collected is either available in other reports or has not been reported yet.

Executive Summary
Fisheries

In the last few years, monitoring by a variety of agencies of fish populations and habitat in the upper Flathead River basin has intensified. Current fish habitat monitoring includes measurements of stream gravel composition and an index of streambed condition called substrate score. fishery monitoring includes population estimates, estimates of spawning runs, and creel census to measure fishermen use and harvest. Special attention has been directed toward native fish stocks of westslope cutthroat and bull trout as well as introduced populations of kokanee salmon which are very popular with fishermen. Both westslope cutthroat and bull trout are listed as species of special concern by the Montana Department of Fish, Wildlife and Parks because of apparent declines in distribution and abundance statewide. The Flathead Forest Plan uses those two species as indicator species because of their sensitivity to environmental disturbance.

The Flathead bull trout population is one of the largest migratory stocks left intact in the United States with an

estimated 6,000-7,000 fish migrating up the river system each summer and fall. Although few significant changes in habitat or population numbers have been detected, agencies are establishing a baseline from which long term or cumulative effects can be evaluated. A major challenge continues to be defining the natural variation of the system so that the actual impacts of land use such as road construction or timber harvest can be determined.

The harmful effects of sediment deposition on bull trout reproduction have been demonstrated, and there is concern that some important spawning and rearing areas are already impacted. Average ~~egg~~ survival of bull trout eggs in a major spawning area of Coal Creek (North Fork tributary) is estimated at ~~only 35~~ 44 percent. Other spawning streams of the North Fork have expected egg survival rates ranging from ~~50~~ 35 percent to over 75 percent. The effect of these rates on abundance of adults is uncertain because other factors may also be limiting the population. Anglers harvest more than 7,000 bull trout in the drainage each year, and the daily bag limit was recently reduced to 1 fish to help maintain the population. A number of spawning streams are also closed to all fishing to maximize spawning potential.

Westslope cutthroat trout abundance also appears stable, but recent genetic surveys have revealed that a number of populations are already hybridized or threatened with hybridization with introduced fish species. A program to protect or restore genetically pure stocks of westslope cutthroat is currently being developed by several agencies.

Kokanee provide more than half of the fishing in the Flathead with harvest exceeding 500,000 salmon in some years. In recent years, population numbers and subsequent harvest have declined due to a combination of factors such as the operation of hydroelectric dams and harvest. McDonald Creek in Glacier National Park is unregulated and relatively free of environmental disturbance and now provides the majority of kokanee spawning in the drainage. Some habitat problems such as flow releases from Hungry Horse Dam have been corrected and fishing seasons and limits have been curtailed to help recovery in other parts of the population, but numbers of salmon are not expected to reach desired levels until 1989 or later. Mysis shrimp were accidentally introduced into Flathead Lake and are currently increasing at a very high rate. Mysis may impact kokanee through food competition or predation, but at this time the magnitude and direction of impacts is unclear.

There is an intimate tie between water quality and fish populations in the Flathead Basin. The salmonid sport fisheries are especially dependent on clean, cold water and their spawning and rearing habitats are vulnerable to degradation from waterborne sediments. Monitoring can help define and explain changes

in fish populations and habitat, and ~~define~~ determine whether changes are due to land use activities such as road construction or timber harvest.

Perhaps two of the most important water quality criteria for stream habitats are sediment loads and water yields. These two factors affect condition of spawning gravels, erosion of streambeds and banks, and nearly all physical components of a stream system. Changes in water quality such as increases in nutrients or water temperature can directly impact fisheries through increased stress or disease or indirectly by impacting the food base. Increases in nutrients or water temperature will tend to favor many introduced species which are tolerant of these conditions over native fish species which are adapted to an unpolluted system. Further decreases in water quality will favor the dominance of "rough" or "trash" fish over the more popular gamefish.

Sport fishing provides over 200,000 days of recreation in the Flathead Basin each year and generates millions of dollars of revenue to the local economies. Clean rivers and lakes and days spent afield fishing are also an integral part of the quality of life for residents and visitors to the Flathead.

Table C.1. Bull trout redd counts for monitored reaches of selected streams in the Flathead Drainage, 1979-1986.

		Y E A R								
Stream	FBC No.	1979	1980	1981	1982	1983	1984	1985	1986	Avg.
North Fork Drainage										
Trail	1011	34[a]	31[a]	78	94	56	32	25	69	52
Whale	1012	35	45	98	211	141	133	94	90	106
Coal	1016	38	34	23	60	73	61	40	13	43
Big	1017	10	20	18	41	22	9	9	12	18
	TOTAL	117	130	217	406	292	235	168[b]	184	219
Middle Fork Drainage										
Ole	3003	--	19	19	51	35	26	30	36	31
Morrison	3008	25[a]	75	32[a]	86	67	38	99	52	59
Lodgepole	3009	32	14	18	23	23	23	20	42	24
Granite	3010	14	34	14[a]	34	31	47	24	37	29
	TOTAL	71	142	83	194	156	134	173	167	143
TOTAL DRAINAGE		188	272	300	600	448	369	341[b]	386	362

[a]Counts may be underestimated due to incomplete survey.
[b]High flows may have obliterated some redds.

Table C.2. Bull trout redd counts on selected reaches of tributaries in the Swan Drainage, 1982-1986.

		Y E A R					
Stream	FBC No.	1982	1983	1984	1985	1986	Avg.
Lion	6001	63	49	88	26	46	54
Goat	6002	33	39	31	40	56	40
Elk	6003	56	91	93	19	53	62
Squeezer	6004	41	57	83	24	55	52
	TOTAL	193	236	295	109	210	208

Table C.3. Juvenile bull trout densities in Coal Creek of the North Fork Flathead river and Morrison Creek of the Middle Fork Flathead River from 1980 to 1986 (after Fraley et al., 1986).

Stream	Date	No. of fish per 164 yards section	95 % Confidence Interval
Coal Creek	08/05/82	130	±36
(Dead Horse	08/23/83	99	±33
Bridge site)	08/31/84	89	±27
(FBC 1016)	08/26/85	167	±66
	08/ /86	149	± ?
Morrison Creek	09/23/80	91	±48
(FBC 3008)	09/01/82	93	± 5
	08/18/83	62	±11
	09/25/85	93	±27
	09/ /86	112	± ?

Table C.4. Comparison of the annual mean percentages of substrate material smaller than 1/4 inch from undisturbed sites in the Dead Horse bridge spawning area from 1981 through 1985 (Weaver and Fraley, 1985).

Station	Year	No. of samples	Percent smaller than 1/4 inch
Coal Creek (FBC 1016)	1981	10	33
(Dead Horse Bridge	1982	19	38
Site)	1983	20	37
	1984	18	33
	1985	20	36

Table C.5. Percentages of substrate material smaller than 1/4 inch from undisturbed sites in the Coal Creek drainage during 1985 core sampling in known bull trout spawning area (after Weaver and Fraley, 1985).

Spawning Area	No. of samples	Percent smaller than 1/4 inch
Dead Horse Bridge (FBC 1016)	20	35.8
North Fork (main Coal)	12	34.2
South Fork Coal	12	37.1

Table C.6. Comparison of the annual mean percentages of material smaller than 1/4 inch from undisturbed sites in Coal, Whale, Trail, and Big Creeks from 1981 to 1985 (after Weaver and White, 1985).

Stream	FBC No.	Year	No. of samples	Percentage smaller than 1/4 inch
Coal Creek	1016	1981	10	33
		1982	19	28
		1982	10	37
		1984	18	33
		1985	20	36
Whale Creek	1012	1981	6	22
		1982	8	35
		1983	11	28
		1985	11	18
Trail Creek	1011	1981	12	23
		1982	16	22
		1983	10	27
		1984	9	28
		1985	12	29
Big Creek	1017	1981	6	22
		1982	9	28
		1983	11	28
		1984	10	27
		1985	12	29

Table C.7. Substrate scores in bull trout rearing areas on the Flathead National Forest.

Stream/ Station	Year 1985	1986
Coal Creeks:		
Dead Horse Bridge	11.6	12.3
North Fork (main Coal)	13.5	14.2
South Fork Coal	12.8	12.0
Big Creek		12.2
Morrison Creek		12.3

Table C.8. Estimates of gamefish harvest from various creel censuses in the Flathead drainage, 1981-1984.

Water	Season	Angler Days	Gamefish: Bull Trout	Lake Trout	Cutthroat	Kokanee	Report
Flathead Drainage							
Flathead Riv*	05/81-11/81	45,000	8,231	----	24,938	76,830	Fredenberg and Graham, 1983
Flathead Lake	05/81-05/82	169,000	5,452	6,947	6,910	495,910	Graham and Fredenberg, 1983
TOTAL		214,600	7,683	6,947	31,848	572,740	
Flathead Lake (summer)	06/35-09/85	54,000	655	1,600	884	129,304	Hanzel, 1986
Swan Drainage							
Swan Lake	5/83-5/84	7,100	739		238		Leathe and Enk, 1985
Swan River	5/83-1,83	6,200	564		536		Leathe and Enk, 1985

*Harvest for main river and North Fork only.

Table C.9. Estimated number of spawning westslope cutthroat runs in Hungry Horse Creek (FBC 2009), South Fork Flathead River drainage.

Year	Estimated Run
1968	1160
1969	1050
1970	1001
1971	702
1972	590
1984	388
1985	370

Table C.10. Population estimates of westslope cutthroat trout in various streams in the Flathead drainage. Estimates are number of fish per 120 square yards of stream except for the Swan tributaries (number per 109 yards of stream).

Stream	FBC No.	YEAR 1980	1981	1982	1983	1984	1985	1986
North Fork Drainage								
Whale	1012		17	2	8			
Coal	1016			12	56	10	9	
(Deadhorse)								
Big	1017							*
Middle Fork Drainage								
Dle	3003			25				*
Challenge	3006	98	126	77	66			*
Swan Drainage								
Lion	6001			1				
Goat	6002			4				
Elk	6003			-				
Squeezer	6004			-				

*Population surveys have been completed, but the estimates have not been calculated yet.

Table C.11. Population estimates for westslope cutthroat trout in various sections of the South Fork Flathead River (FBC 2001). Estimates are shown as number of trout per 0.6 miles of river.

Section	Year	Population Estimate
Headwaters	1981	206
White River	1981	101
Gordon Creek	1981	177
	1986	183
Black Bear	1985	527
Mid Creek	1983	680
Harrison	1981	248
	1985	215

Table C.12. Counts of kokanee spawners by major spawning area in the Flathead drainage, 1979-1986.

		YEAR							
Stream	FBC No.	1979	1980	1981	1982	1983	1984	1985	1986
Flathead River	5001	1680	320	6310	1830	6315	3360	4510	*
Flathead Lake	5014	----	----	652	1039	743	1134	1156	*
South Fork FHR	2001	----	----	700	500	5200	7500	2100	*
Whitefish River	4021	----	1000	1000	1800	1300	2400	----	*
McDonald Creek	3004	65,000	49,500	103,500	31,000	34,300	86,500	122,960	19,530

*Counts not completed yet.

Table C.13. Summary of data for kokanee in Flathead River and Lake, 1979-1986.

	Acoustic Estimate Fish/Acre		Spawning Run		Angler Harvest		
Year	Small	Large	Estimated Number	Avg. Length Males(River)	Winter	Summer	Spawners
1979	12.8	5.9	71,800	13.6			
1980	10.7	7.5	51,600	14.6			
1981	10.7	5.0	132,900	14.7		360,600	152,117
1982	16.3	6.7	41,900	15.0	113,000		30,449
1983	16.8	1.6	60,900	14.8	45,000		4,234
1984	10.4	6.2	118,200	13.9	45,000		12,243
1985	10.2	5.5	150,000	14.6	50,000	132,700	13,796
1986					47,000		2,655

Table C.14. Mysis densities in six lakes in northwest Montana, June, 1983-1985.

	YEAR		
Lake	1983	1984	1985
Ashley	1.3	13.0	12.1
Little Bitterroot	7.3	24.5	21.9
Flathead	0	5.1	19.3
McGregor	6.1	13.7	3.8
Swan	20.1	71.0	94.9
Whitefish	18.5	86.3	229.0

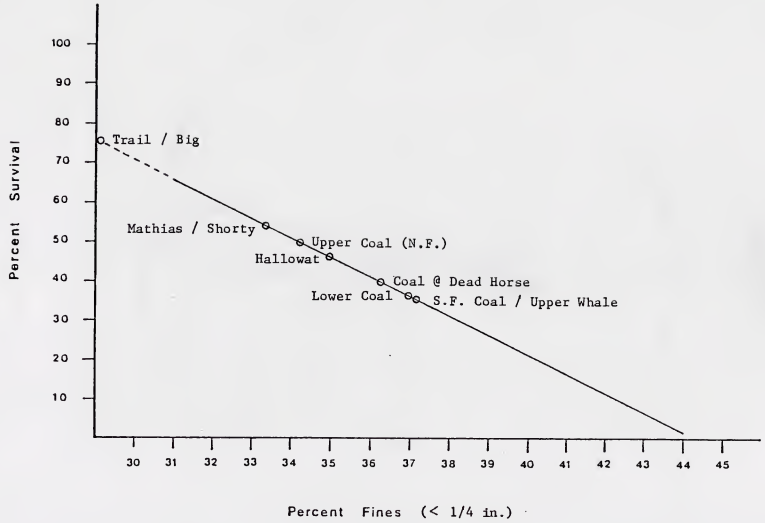
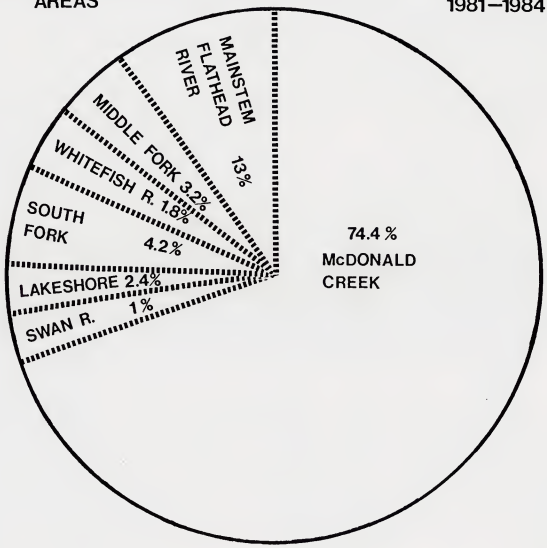


Figure C.1. Expected survival rates for bull trout eggs at spawning sites in North Fork Flathead River tributaries, based on percent of fine material less than 6.4 mm (¼ in.) in 1985 samples. Relationship (solid line) between percent fines and percent survival is from Weaver and White (1985).

Fig.C.2 RELATIVE CONTRIBUTION OF FLATHEAD KOKANEE SPAWNING AREAS 1981–1984



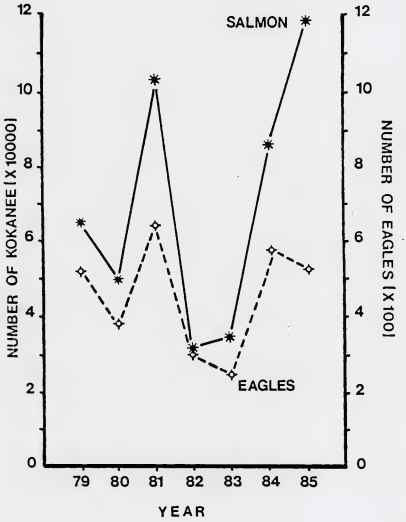


Fig. C.3. Correlation of numbers of spawning kokanee and migratory bald eagles on McDonald Creek, Glacier National Park.

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